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Vol. 1052 Number 4

260

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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March 26, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 26, 1985 Volume 1052 Number 4

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THE UNIVERSITY OF MICHIGAN

JUN 04 1985

ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

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COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

MAY 16 1985

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 24/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	no charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Feb. 4, 1985.

1052 OG 52

Patent Cooperation Treaty (PCT) Update

Accession to the Patent Cooperation Treaty (PCT) by Barbados, ratification of the PCT by Italy and listing of PCT Member Countries.

The United States Patent and Trademark Office has received notification from the World Intellectual Property Organization (WIPO) that Barbados deposited its instrument of accession to the PCT on 12 Dec. 1984. Therefore, according to PCT Article 63(2), Barbados may be designated in international applications filed on and after 12 Mar. 1985.

The Office also received notification from WIPO that Italy deposited its instrument of ratification to the PCT on 28 Dec. 1984. Therefore, Italy may be designated in international applications filed on and after 28 Mar. 1985. It should be noted that only regional patent protection through the European Patent Office will be available for PCT applications designating Italy. Applicants who wish to secure an Italian national patent must file directly with the Italian Patent Office.

The entry into force of the PCT for Italy is of particular importance since it has the consequence that, as from 28 Mar. 1985, all countries party to the European Patent Convention (Austria, Belgium, France, Germany (Federal Republic of), Italy, Liechtenstein, Luxembourg, the Netherlands, Sweden, Switzerland and the United Kingdom) will also be party to the PCT. This opens the possibility of obtaining, by filing a single international application under the PCT, a European patent for all those countries with the same rights as would be conferred by a national patent granted in each country. Currently, about 5000 designations of Italy are made by applicants from the United States in European patent applications each year.

See listing of PCT Member Countries on next page.

Listing of PCT Member Countries

	Country	Ratification or Accession	Date of Ratification or Accession	Date from which Country may be Designated
(1)	Central African Republic*	Accession	15 September 1971	01 June 1978
(2)	Senegal*	Ratification	08 March 1972	01 June 1978
(3)	Madagascar	Ratification	27 March 1972	01 June 1978
(4)	Malawi	Accession	16 May 1972	01 June 1978
(5)	Cameroon*	Accession	15 March 1973	01 June 1978
(6)	Chad*	Accession	12 February 1974	01 June 1978
(7)	Togo*	Ratification	28 January 1975	01 June 1978
(8)	Gabon*	Accession	06 March 1975	01 June 1978
(9)	United States of America	Ratification	26 November 1975	01 June 1978
(10)	Germany, Federal Republic of**	Ratification	19 July 1976	01 June 1978
(11)	Congo*	Accession	08 August 1977	01 June 1978
(12)	Switzerland**	Ratification	14 September 1977	01 June 1978
(13)	United Kingdom**	Ratification	24 October 1977	01 June 1978
(14)	France**	Ratification	25 November 1977	01 June 1978
(15)	Soviet Union	Ratification	29 December 1977	01 June 1978
(16)	Brazil	Ratification	09 January 1978	01 June 1978
(17)	Luxembourg**	Ratification	31 January 1978	01 June 1978
(18)	Sweden**	Ratification	17 February 1978	01 June 1978
(19)	Japan	Ratification	01 July 1978	01 October 1978
(20)	Denmark	Ratification	01 September 1978	01 December 1978
(21)	Austria**	Ratification	23 January 1979	23 April 1979
(22)	Monaco	Ratification	22 March 1979	22 June 1979
(23)	Netherlands**	Ratification	10 April 1979	10 July 1979
(24)	Romania	Accession	23 April 1979	23 July 1979
(25)	Norway	Ratification	01 October 1979	01 January 1980
(26)	Liechtenstein**	Accession	19 December 1979	19 March 1980
(27)	Australia	Accession	31 December 1979	31 March 1980
(28)	Hungary	Ratification	27 March 1980	27 June 1980
(29)	Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30)	Finland	Ratification	01 July 1980	01 October 1980
(31)	Belgium**	Ratification	14 September 1981	14 December 1981
(32)	Sri Lanka	Accession	26 November 1981	26 February 1982
(33)	Mauritania*	Accession	13 January 1983	13 April 1983
(34)	Sudan	Accession	16 January 1984	16 April 1984
(35)	Bulgaria	Accession	21 February 1984	21 May 1984
(36)	Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37)	Mali*	Accession	19 July 1984	19 October 1984
(38)	Barbados	Accession	12 December 1984	12 March 1985
(39)	Italy**	Ratification	28 December 1984	28 March 1985

* Members of African Intellectual Property Organization (OAPI) regional patent system. Only regional patent protection is available for OAPI member countries. A designation of any country is an indication that all OAPI countries have been designated. Note: Only one designation fee is due regardless of the number of OAPI member countries designated.

**Member of European Patent Convention (EPC) regional patent system. Either national patents or European patents for member countries are available through PCT, except for France, Belgium and Italy, for which only European patents are available if PCT is used. Note: Only one PCT designation fee is due if European regional patent protection is sought for one, several or all EPC member countries.

Feb. 4, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Mar. 23, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,320,537 through 4,321,707

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,580,164, Re. S.N. 694,089, Filed Jan. 23, 1985, Cl. 99/339, HAMBURGER COOKING MACHINE, Edward D. Baker, Owner of Record: *Nieco Corp., Burlingame, Calif.,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 242

4,049,404, Re. S.N. 693,539, Filed Jan. 22, 1985, Cl. 55/387, VENTILATION SYSTEM WITH THERMAL ENERGY RECOVERY, Arthur C. W. Johnson, Owner of Record: *Combustion Research Corp., Pontiac, Mich.,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 135

4,230,047, Re. S.N. 678,286, Filed Dec. 5, 1984, Cl. 105/197.004, RAILWAY TRUCK BOLSTER FRICTION ASSEMBLY, Donald Wiebe, Owner of Record: *A. Stucki Co., Pittsburgh, Pa.,* Attorney or Agent: J. Stewart Brams, Ex. Gp.: 316

4,335,556, Re. S.N. 607,058 Filed May 4, 1984, Cl. 52/655, FRAME GIRDER FOR UNDERGROUND DRIFT AND SHAFT CONSTRUCTION, Edgar Arnold, Owner of Record: *Pantex-Stahl AG, Buron, Switzerland,* Attorney or Agent: Richard Wiener, et al., Ex. Gp.: 354

4,369,433, Re. S.N. 692,197, Filed Jan. 17, 1985, Cl. 340/347, DIGITAL-TO-ANALOG CONVERTER AND PCM ENCODER USING THE CONVERTER, Kazuo Yamakido, Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 234

4,385,823, Re. S.N. 695,497, Filed Jan. 28, 1985, Cl. 355/3R, METHOD AND MEANS FOR IMPROVING MAXIMUM DENSITY AND TONAL RANGE OF ELECTROGRAPHIC IMAGES, George P. Kasper, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Torger N. Dahl, et al., Ex. Gp.: 215

4,404,146, Re. S.N. 621,859, Filed June 18, 1984, Cl. 260/429.9, METAL OXYALKYLATES AND METHOD OF MAKING SAME, Joseph E. Lionelle, et al., Owner of Record: *Biosystems Research, Inc., Salida, Colo.,* Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 124

4,411,963, Re. S.N. 691,285, Filed Jan. 14, 1984, Cl. 428/622, THIN FILM RECORDING AND METHOD OF MAKING, Harry E. Aine, Owner of Record: *Inventor, Palo Alto, Calif.,* Attorney or Agent: None, Ex. Gp.: 111

4,435,854, Re. S.N. 693,879, Filed Jan. 23, 1985, Cl. 3/1.913, HIP JOINT PROSTHESIS WITH A SHAFT TO BE FITTED INTO THE MEDULLARY CANAL OF THE FEMUR, Arnold Keller, Owner of Record: *Waldemar Link GmbH & Co., Hamburg, Germany,* Attorney or Agent: Ralph H. Chilton, et al., Ex. Gp.: 332

4,445,143, Re. S.N. 691,267, Filed Jan. 14, 1985, Cl. 358/322, MEANS FOR COMPATIBLY REPRODUCING VIDEO DISCS RECORDED ACCORDING TO DIFFERENT BROADCAST STANDARDS, Toyota Machida, et al., Owner of Record: *Victor Co. of Japan, Ltd., Kanagawa-Ken, Japa* Attorney or Agent: Louis Bernat, Ex. Gp.: 262

4,480,997, Re. S.N. 692,500, Filed Jan. 18, 1985, Cl. 433/221, DENTAL POST AND WRENCH THEREFOR AND METHOD OF RESTORING BULKL TO A TOOTH ROOT THEREWITH, Allan S. Deutsch, et al., Owner of Record: *Inventor(s), New Yor, N.Y.,* Attorney or Agent: Jerome Bauer, et al., Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,489,670, Reexam. No. 90/000,722, Requested: Feb. 8, 1985, Cl. 204/129, PROCESS FOR GAS PURIFICATION, H. J. R. Maget, Owner of Record: *General Electric Co., Wilmington, Mass.*, Attorney or Agent: I. David Blumenfeld, Ex. Gp.: 112, Requester: Murray, Whisenhunt & Ferguson, Arlington, Va.

3,966,419, Reexam. No. 90/000,726, Requested: Feb. 25, 1985, Cl. 422/179, CATALYTIC CONVERTER HAVING MONOLITH WITH MICA SUPPORT MEANS THEREFOR, Rodger E. Bloomfield, Owner of Record: *General Motor Corp., Detroit, Mich.*, Attorney or Agent: R. L. Phillips, Ex. Gp.: 134, Requester: Owner

4,037,324, Reexam. No. 90/000,725, Requested: Feb. 19, 1985, Cl. 32/14, METHOD AND SYSTEM FOR ORTHODONTIC MOVING OF TEETH, George F. Andreasen, Owner of Record: *University of Iowa Research Foundation, Iowa City, Iowa,* Attorney or Agent: Richard G. Young, Ex. Gp.: 330, Requester: Owner

4,065,386, Reexam. No. 90/000,723, Requested: Feb. 19, 1985, Cl. 210/60, ALGAE GROWTH CONTROL, Robert A. Rigby, Owner of Record: *Algarid Pty. Ltd., Balwyn, Victoria, Australia,* Attorney or Agent: Jack M. Wiseman, Ex. Gp.: 130, Requester: Owner

4,407,076, Reexam. No. 90/000,728, Requested: Feb. 22, 1985, Cl. 34/9.5, PROCESS FOR TREATING WOOD, Magnus F. O. Estberg, Owner of Record: *Kenogard AB, Stockholm, Sweden,* Attorney or Agent: Fred C. Philpitt, Ex. Gp.: 344, Requester: Hager System AB, Alexandria, Va.

4,412,573, Reexam. No. 90/000,730, Requested: Feb. 25, 1985, Cl. 604/415, INJECTION SITE, Brian D. Zdeb, Owner of Record: *Baxter Travenol Laboratories, Inc., Deerfield, Ill.*, Attorney or Agent: Bradford R. L. Price, Ex. Gp.: 336, Requester: Owner

4,470,385, Reexam. No. 90/000,727, Requested: Feb. 25, 1985, Cl. 123/146.5, IGNITION DISTRIBUTOR, John F. Burk, Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: C. R. Meland, Ex. Gp.: 340, Requester: Owner

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Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Joines Body Co., Galax, Va., Reg. No. 820,236, for the mark "ALUMIVAN", Canc. 14,315.

Hancock Iron Works, Inc., assignee of Meco, Inc., Pontiac, Mich., Reg. No. 442,528, for the mark "PORTA-GRILL", Canc. No. 14,332.

Peter Pan International, Inc., by change of name from Peter Pan Swimwear International, Inc., New York, N.Y., Reg. No. 629,589, for the mark "LIGHT-FANTASTIC", Canc. No. 14,363.

Rogers Wholesalers, Inc., formerly known as Gilserv Wholesalers, Inc., assignee of Rogers Wholesalers, Inc., Jamaica, N.Y., Reg. No. 897,111, for the mark "COMPU-RX" and design, Canc. No. 14.420.

Voice Entry Control Systems, Inc., Alexandria, Va., Reg. No. 1,193,393, for the mark "VECS", Canc. No. 14,442.

Kleen-Roof Corp., Inc., Cullman, Ala., Reg. No. 942,128, for the mark "KLEEN ROOF" and design, Canc. No. 14,552.

Homes of America, Inc., Washington, D.C., Reg. No. 1,118,444, for the mark "HOMES OF AMERICA" and design, Canc. No. 14,562.

Ricardo, Inc., Miami Springs, Fla., Reg. No. 873,064, for the mark "RICARDO", Canc. No. 14,609.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

MARGARET M. LAURENCE,
Jan. 10, 1985. *Assistant Commissioner for Trademarks.*

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-436,541 (4,495,207). PRODUCTION OF FOOD-GRADE CORN GERM PRODUCT BY SUPERCRITICAL FLUID EXTRACTION.

SN 6-534,015 (4,493,854). PRODUCTION OF DEFATTED SOYBEAN PRODUCTS BY SUPERCRITICAL FLUID EXTRACTION.
SN 6-680,615. OUTPUT RESPONSIVE FIELD CONTROL FOR WIND-DRIVEN ALTERNATORS AND GENERATORS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-402,352 (4,495,279). ISOELECTRIC FOCUSSING-POLYNUCLEOTIDE/POLYACRYLAMIDE GEL ELECTROPHORESIS.
SN 6-687,370. ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) FOR DETERMINING ANTIBODIES AGAINST HERPES SIMPLEX VIRUS (HSV) TYPES I AND II IN HUMAN SERA.

DEPARTMENT OF THE ARMY

SN 6-311,371 (4,493,930). MEDICINAL 2-ACETYL- AND 2-PROPIONYLPYRIDINE THIOSEMICARBAZONES AND PREPARATION THEREOF.

DEPARTMENT OF THE INTERIOR

SN 6-473,294 (4,494,894). EXTENSIBLE BRATTICE SUPPORT SYSTEM FOR MINE FACE VENTILATION.

Availability of Copies of the Magnetic Tape of the Fourth Edition of the International Patent Classification (IPC)

The Assembly of the IPC Union has decided to make available copies of the magnetic tapes of the IPC through the International Bureau of the World Intellectual Property Organization.

The IPC Assembly made the following decisions:

"The International Bureau should put at the disposal of the Industrial Property Offices of any country member of the IPC Union which so wishes the magnetic tape. . .of the IPC *at cost,* provided that any such Office receiving a tape accepts the three conditions set forth. . .below:

(i) the tape is used by those Offices. . .for the purposes of carrying out their functions,
(ii) no reproduction of the tape or its contents, in whole or in part, is made in the form of paper copies or microfiches, except in the case of online printouts, and
(iii) the tapes or copies thereof, in whole or in part, are not made available to any third party."

The Committee of Experts of the IPC Union decided that the tape (in English *or* French language) would be made available to Industrial Property Offices of countries being members of the IPC Union at the price of 1,000 Swiss francs.

In order to carry out its function of disseminating patent information contained on IPC tapes, the U.S. Patent and Trademark Office may need the assistance of qualified U.S. public organizations or private companies. Accordingly, the Office will consider requests from such organizations or companies interested in disseminating such information.

The Committee also decided that, subject to the conditions enumerated in (ii) and (iii) above, the tapes would be made available for the following prices to any public organization or private company authorized by its government:

- for internal use only, at the price of 5,000 Swiss francs; and
- for exploitation of the tape on a commercial basis, at the price of 30,000 Swiss francs.

The Patent and Trademark Office will authorize United States public organizations and private companies to purchase the tape under these conditions and at the agreed upon prices quoted.

For further information contact:

Office of International Patent Classification
Crystal Square, Bldg. 4, Room 108
U.S. Patent and Trademark Office
Washington, D.C. 20231
Tel: (703) 557-3756

WILLIAM S. LAWSON,
Feb. 1, 1985. *Administrator for Documentation.*

Computer Aided Search for Class 364 Subclasses 200 and 900

In 1975 the Patent and Trademark Office installed an experimental computer search system for searching the computer and digital data processing system arts classified in Class 364/200 and 900. This system, known as Computer Controlled Microform Search System (CCMSS), functioned until 1983 when it could no longer be kept operational.

A new computer aided search system, Computer Aided Search and Patent Image Retrieval (CASPIR), has been installed and is available to the public. The new system possesses features similar to the previous system in that each subclass is searchable using a topic index list of approximately 400 terms, which may be combined with Boolean logic into a search question. The user is able to view from 5 to 12 pages of documents meeting the search strategy under computer control of a microfilm viewer.

CASPIR has all of the original data base of the CCMSS (which covered patents dated 1950-1981). In addition, its data base, coded and filmed, has been updated through Sept., 1984.

It is anticipated that CASPIR will be updated according to the following schedule. Once a month the codes assigned to new documents will be entered into the data base by Patent and Trademark Office personnel. Documents thus entered will not be available on the microfilm viewer but will show up on the data terminal in response to search questions. Users would need to consult search room paper files to see the documents. To assure efficient filming and maximum use of the film strips, the filming of coded documents will take place on a quarterly basis — Jan., Apr., July and Oct. Following this procedure, the coded data base should not be more than one to two months behind current patent issue dates and the filmed copies of coded documents should not be more than three to four months behind current patent issue dates.

Terminals are currently available for public use in Crystal Plz. 2, Room 5C-22. Reservations for terminal use may be made by calling 703-557-3651 during normal business hours. Patent and Trademark Office personnel are available to assist the user in terminal operation. Effective Mar. 11, 1985 these public terminals will be moved to the Public Search Room in Crystal Plz. CP3-1A-3. Reservations for use may then be made by contacting Mr. Bernard Thomas at 703-557-2276.

EARL LEVY,
Feb. 5, 1985. *Director, Group 230 Patent and Trademark Office.*

Errata

The Registrant of Registration No. 775,823 listed in the "Index of Registrants" Section of the Trademark Official Gazette of Dec. 25, 1984, at TMI 16, was incorrectly identified as "Schotte Glaswerke, Jenear Glaswerk Schott & Gen."

The Registrant's name as corrected is Jenaer Glaswerk Schott & Gen.

CHARLES J. CONDRO,
Feb. 14, 1985. *Administrator for Policy and Procedures.*

Status of PTO Services

The following is an update of the status of PTO services for February 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	28	Due to automation problems.
Trademarks	30	41	
Patent/Trademark Copies:			
Window Coupons	5	90% within 5 days	
Mail Coupons	29	98% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		February 7, 1985	
Current Mail Date being processed		February 18, 1985	
Certified Copies:			
Trademark Registrations	30	17	
Status Copies (excluding title)	15	96% within 15 days	
Applications-As-Filed	20	99% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	98% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	39	
Filing Reg. Certificates	3	9	Backlog being reduced.
Assignments:			
Patents	25	17	
Trademarks	25	18	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 6 days late	Delay due to new printing contractor.
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	On Schedule	
Patent Copies Available	Issue Date	92% within 4 days	Delay due to new printing contractor.
Trademark Copies Available	Issue Date	98% within 7 days	

*Figures include postal processing and delivery time.

IMPROVEMENTS TO SERVICE

- *Trademark Search Library* — All shoe cases have been repaired. Handles have been replaced or tightened and pullout shelves have all been made operative.
- *Copy Fulfillment Service* — All mail orders for patent and trademark copies now include a packing slip to identify enclosed copies as well as those copies that might be missing due to late receipt of new issue copies from printing contractor.
- *Official Searching for Files* — Actions continue to be taken to deal with the difficulties in locating "lost" files. It has been found that some "lost" pending files are eventually located with patented or abandoned files in the PTO File Repository. To prevent such misrouting of files, an edit has been added to the automated Patent Application Location and Monitoring System (PALM) to reject any transaction to receive such files in the File Repository. This edit prompts the return of the file, allowing corrective action to be taken at the location which incorrectly sent the file.

HELPFUL HINTS FROM THE PTO

- *Express Mail* — Many applicants are losing the advantage of receiving the date a paper or fee was deposited at the Post Office when "Express Mail" is used, due to a failure of following proper procedures. According to Chapter 37 CFR §1.10, any such paper or fee must include a certificate of mailing by "Express Mail," signed by the person mailing the paper or fee.

  Often, the certificate is missing, illegible, inaccurate, incomplete, or difficult to locate. As a result, the paper or fee is considered to have been filed on the date of receipt in the PTO.

To ensure papers and fees sent by "Express Mail" are accorded the proper certificate date, the following suggestions/reminders are offered:

- Each document must have a certificate of mailing typed on or affixed to the document.
- The certificate should be placed on the first page of the document or the covering letter to ensure easy accessibility.
- The certificate should be legible.
- Dates on the certificate must correspond to dates on the Express Mail label.
- Each certificate must have an original signature.

The preferred wording and information to be included on this certificate is as follows:

"Express Mail" Mailing Label No. (*insert B no. from Express Mail label*)
Date of Deposit (*insert date from Express Mail Label*)
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office To Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(*Typed or printed name of person mailing paper or fee*)

(*Signature of person mailing paper or fee*) By following these procedures, problems concerning filing dates should be minimized.

- *Extension of Time Policy* — Where an extension of time is required to file a response in a timely manner, the response is not considered complete until the response, fee, and request or petition for an extension of time are received. The fee and request or petition must be filed before the expiration of the extended period requested. The fee cannot be paid outside the statutory six-month limit for the period of response.

The extension of time policy for after final practice is set forth in MPEP §§706.07(f) and 1302.04. In essence, where applicants' approval is not needed to amend the claims, no extension of time is required. However, if applicants' approval is required and applicants did not file their response within two months of the FINAL REJECTION, the appropriate extension of time must be purchased.

If applicants have a deposit account, it is recommended that applicants file, in an individual application, a general authorization to charge any of the fees set forth in 37 CFR §§1.16 to 1.18 to a deposit account for the entire pendency of the application (1032 OG 32).

Also, it should be noted that extensions of time may be purchased for extending the time required to pay for the request for an oral hearing before the Board of Appeals. MPEP §1209(1). The time for a request and fee for an oral hearing is one month from the date of the Examiner's Answer or any supplemental Examiner's Answer.

THERESA A. BRELSFORD
Mar. 4, 1985. *Assistant Commissioner for Administration.*

PATENT NOTICES

Certificates of Correction for the Week of Mar. 26, 1985

Pp. 3,637	4,421,635	4,448,927	4,468,204
Pp. 5,248	4,423,255	4,449,013	4,468,266
Re. 31,176	4,424,108	4,449,356	4,468,377
Re. 31,672	4,424,497	4,449,551	4,468,462
D. 273,671	4,425,419	4,450,666	4,468,729
D. 274,822	4,426,383	4,452,197	4,468,798
D. 275,810	4,427,405	4,452,719	4,468,970
D. 276,282	4,428,068	4,452,824	4,468,987
3,742,004	4,429,191	4,453,025	4,469,178
3,932,044	4,429,958	4,453,474	4,469,291
3,933,428	4,430,160	4,453,860	4,469,372
3,973,051	4,430,891	4,454,046	4,470,259
4,220,440	4,430,946	4,454,378	4,470,769
4,232,321	4,431,787	4,454,847	4,470,787
4,249,975	4,431,845	4,455,065	4,471,079
4,294,653	4,431,977	4,455,189	4,471,110
4,299,118	4,432,014	4,455,247	4,471,187
4,313,004	4,432,174	4,456,368	4,471,189
4,323,598	4,433,139	4,456,432	4,471,239
4,350,686	4,435,040	4,456,527	4,471,375
4,365,019	4,435,351	4,456,680	4,471,487
4,368,021	4,435,601	4,458,267	4,472,235
4,369,245	4,436,644	4,458,286	4,472,798
4,371,323	4,438,169	4,459,142	4,473,123
4,378,161	4,439,799	4,459,344	4,473,296
4,378,396	4,439,843	4,459,686	4,473,523
4,381,360	4,440,014	4,459,758	4,473,661
4,382,338	4,440,116	4,461,598	4,473,736
4,383,584	4,442,099	4,461,899	4,473,787
4,387,272	4,442,102	4,462,136	4,473,914
4,388,571	4,443,017	4,462,158	4,474,153
4,393,933	4,443,357	4,462,507	4,474,352
4,395,496	4,443,761	4,463,060	4,475,644
4,395,768	4,443,849	4,463,415	4,477,920
4,396,617	4,444,126	4,463,438	4,479,111
4,397,464	4,444,431	4,463,474	4,479,123
4,398,005	4,444,773	4,463,523	4,479,232
4,399,216	4,444,905	4,464,320	4,479,404
4,404,182	4,445,011	4,464,390	4,479,520
4,407,629	4,445,547	4,464,957	4,479,758
4,408,008	4,445,839	4,465,171	4,479,776
4,408,076	4,445,921	4,465,593	4,480,143
4,409,206	4,446,078	4,465,991	4,480,181
4,410,053	4,446,352	4,466,172	4,481,024
4,411,678	4,446,386	4,466,388	4,481,083
4,412,008	4,446,770	4,466,538	4,481,437
4,412,372	4,447,856	4,466,780	4,481,606
4,418,865	4,448,290	4,466,925	4,482,235
4,421,057	4,448,487	4,467,052	4,482,422
4,421,363	4,448,840	4,467,562	4,482,426

Disclaimers

3,962,833.—*Dee Lynn Johnson,* Woodbury, Minn. METHOD FOR THE ALTERATION OF A LENS AND AN ADHESIVE LENS BLOCKING PAD USED THEREIN. Patent dated June 15, 1976. Disclaimer filed Jan. 22, 1979, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby enters this disclaimer to claims 19–25 of said patent.

4,059,946.—*Dieter Bottcher,* Bad Uberkingen; *Heinz Schulz,* Donzdorf; *Fritz Stahlecker,* Bad Uberkingen, all of Germany. METHOD AND APPARATUS FOR START-SPINNING A THREAD ON OPEN-END SPINNING UNITS. Patent dated Nov. 29, 1977. Disclaimer filed Jan. 24, 1985, by the assignee, *Fritz Stahlecker and Hans Stahlecker.*

The term of this patent subsequent to May 10, 1994 has been disclaimed.

4,249,323.—*Robert D. Mathis,* Salt Lake and *Gordon Hine,* Logan, both of Utah. VARIABLE WING PLOW BLADE AND MOUNTING STRUCTURE THEREFOR. Patent dated Feb. 10, 1981. Disclaimer filed Jan. 28, 1985, by the assignee, *Logan Manufacturing Co.*

Hereby enters this disclaimer to claims 1–5 of said patent.

4,419,864.—*Alden I. McFarlan,* Westfield, N.J. AIR CONDITIONING SYSTEM AND METHOD. Patent dated Dec. 13, 1983. Disclaimer filed Oct. 25, 1984, by the *inventor.*

The term of this patent subsequent to Nov. 8, 2000 has been disclaimed.

4,450,154.—*Yasuhiko Masuho,* Hino and *Takeshi Hara,* Hachioji, both of Tokyo, Japan. ANTITUMOR HYBRID AND PROCESS FOR THE PREPARATION THEREOF. Patent dated May 22, 1984. Disclaimer filed Jan. 28, 1985, by the assignee, *Teijin Ltd.*

Hereby enters this disclaimer to claim 1 of said patent.

4,495,666.—*Harry H. Herman, Jr.,* Chevy Chase, Md. BATHTUB CUSHION LIFT ASSEMBLY. Patent dated Jan. 29, 1985. Disclaimer filed Jan. 24, 1985, by the assignee, *International Healthcare Products, Inc.*

The term of this patent subsequent to Mar. 10, 1998 has been disclaimed.

Disclaimers and Dedications

4,115,235.—*David M. Capone,* Oakmont, Pa. APPARATUS FOR CONVEYING A GAS SAMPLE THROUGH AN ANALYZER CHAMBER. Patent dated Sept. 19, 1978. Disclaimer and dedication filed Jan. 14, 1985, by the assignee, *Ametek, Inc.*

Hereby disclaims and dedicates to the public all claims of said patent.

4,169,769.—*David M. Capone,* Oakmont, Pa. METHOD FOR CONVEYING A GAS SAMPLE THROUGH AN ANALYZER CHAMBER. Patent dated Oct. 2, 1979. Disclaimer and dedication filed Jan. 14, 1985, by the assignee, *Ametek, Inc.*

Hereby disclaims and dedicates to the public all claims of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	Springfield: Illinois State Library	(217) 782-5430
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Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
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	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
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	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Libra	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-25-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-05-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-01-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-07-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	10-25-68
DESIGN, GROUP 290—K. L. CAGE, Director	9-17-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-19-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-29-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-15-82

Expiration of patents: The patents within the range of numbers indicated below expire during February 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,366,970 to 3,371,350, inclusive

Plant Patents ..... Numbers 2,784 to 2,793 inclusive

REEXAMINATIONS

MARCH 26, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Des. 256,345 (318th)

TIRE CARRIER FOR A VAN TYPE VEHICLE

Raymond C. Weiler, Fontana, Calif., assignor to Blackstone Manufacturing Co., Inc., Chicago, Ill.

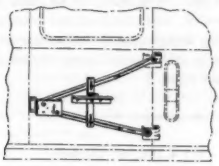
Reexamination Request No. 90/000, 388, May 31, 1983.

Reexamination Certificate for Pat. No. Des. 256,345, issued Aug. 12, 1980, Ser. No. 45,518, Jun. 4, 1979.

U.S. Cl. D12—202

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The claim is cancelled.



B1 3,590,854 (319th)

ROLLING CONDUCTOR SUPPORT

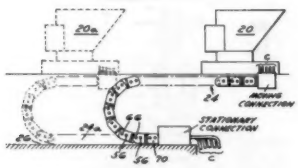
Gordon H. Cork, Birmingham, Mich., assignor to McGraw-Edison, Elgin, Ill.

Reexamination Request No. 90/000,243, Aug. 18, 1982.

Reexamination Certificate for Patent No. 3,590,854, issued Jul. 6, 1971, Ser. No. 770,468, Oct. 9, 1968.

Int. Cl.[3] B65H *75/36*

U.S. Cl. 137—355.16



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–28** is confirmed.

1. A rolling conductor support comprising: a plurality of chains connected together in laterally spaced-apart relation by conductor carrying means extending therebetween, each chain including a succession of links having contiguous overlapping pivotally connected end portions, characterized in that the pivotal connection includes a pair of spaced pivot parts extending laterally between and connecting together the overlapping end portions, at least one of said pivot parts providing a fulcrum for pivotal movement between the links, at least one of the overlapping end portions having a slot of determined arcuate length measured in relation to said fulcrum, and the other pivot part interfitting in said slot and fixed to the other overlapping end portion and movable in the slot through the arcuate length thereof to limit pivotal movement between the links.

B1 3,947,241 (320th)

FOOD TREATMENT APPARATUS AND PROCESS

Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

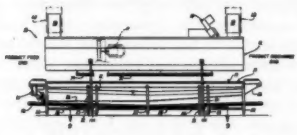
Reexamination Request No. 90/000,533, Mar. 22, 1984.

Reexamination Certificate for Patent No. 3,947,241, issued Mar. 30, 1976, Ser. No. 544,393, Jan. 27, 1975.

Continuation of Ser. No. 328,925, Feb. 2, 1973, abandoned.

Int. Cl.[3] F27B *9/00, 9/14*

U.S. Cl. 432—121



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11** is confirmed.

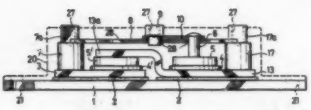
1. An oven operative at substantially atmospheric pressure for food treatment comprising an elongate oven housing having top, bottom, side and end walls, means serving to supply a process vapor into said housing, a partition dividing said housing into a process vapor heating chamber and a food processing chamber, said housing end walls having openings therein defining product inlets and outlets to said processing chamber, at least one exhaust opening on said housing, baffle members arranged in said oven and coacting with the wall portions thereof to furnish a flow passageway from said product inlet to the exhaust opening and from said product outlet to the exhaust opening, said exhaust opening and baffle member permitting a draft to sweep air entering said oven through said product inlet and said product outlet up through said exhaust opening and out of the oven serving to control air from entry into the process vapor, said conveyor means including a conveyor belt arranged to carry solid food products thereon through processing chamber and being of previous construction to permit circulation therethrough of the process vapor, first power means serving to drive said conveyor means, heating means arranged in said heating chamber serving to raise and maintain the vapor therein at a selected processing temperature, means for positively circulating the process vapor, second power means serving to drive said vapor circulating means, baffle means coacting with said partition serving to permit said circulating means to generate a draft of the process vapor from said heating compartment through said process compartment and along said conveyor and thence serving to effect recirculated return of the process vapor to said heating chamber.

B1 4,047,197 (321st)

HOUSING AND LEAD STRUCTURE FOR A SERIES CONNECTED SEMICONDUCTOR RECTIFIER ARRANGEMENT

Winfried Schierz, Roth, Fed. Rep. of Germany, assignor to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnburg, Fed. Rep. of Germany

Reexamination Request No. 90/000,561, May 21, 1984.
Reexamination Certificate for Patent No. 4,047,197, issued Sep. 6, 1977, Ser. No. 677,851, Apr. 16, 1976.
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1975, 7512573[U]
Int. Cl.[3] H01L *23/02, 23/28, 39/02, 23/16*
U.S. Cl. 357—81



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are determined to be patentable as amended.

Claims **3–19**, dependent on an amended claim, are determined to be patentable.

1. A semiconductor rectifier arrangement comprising in combination:

a metal base plate;

a layer of electrically insulating but thermally conductive material fastened to the upper surface of said base plate;

a pair of electrical contact layers fastened to the surface of said layer of insulating material and electrically isolated from one another;

a pair of semiconductor rectifier devices, each having at least one pn junction and a connecting contact on each of its two opposite major surfaces, each of said semiconductor devices being mounted on and having one of its said connecting contacts electrically connected to a respective one of said electrical contact layers;

conductive means for electrically connecting one connecting contact on one of said semiconductor rectifier devices to one connecting contact on the other of said semiconductor rectifier devices to connect said semiconductor devices in a series circuit;

first, second and third current conducting terminals connected to the input of said series circuit, to the output of said series circuit, and to said conductive means, respectively, said first, second and third current conducting terminals being arranged in a row with each of the two outer current conducting terminals of said row being electrically conductively connected to one of said electrical contact layers *with one of said two outer current conducting terminals being said third current conducting terminal;* and

a plastic housing connected to said base plate and in which said series circuit, including its connecting parts is disposed.

B1 4,088,624 (322nd)

SELF-HARDENING MOLDING COMPOSITIONS

Asita Bhattacharyya, Senlis; Michel Jean-Claude Dormoy, Chantilly, and Gerard Y. Richard, Precy sur Oise, all of France, assignors to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C., Asnieres, France.

Reexamination Request No. 90/000,514, Mar. 5, 1984.
Reexamination Certificate for Patent No. 4,088,624, issued May 9, 1978, Ser. No. 682,214, May 3, 1976.
Claims priority, application France, Dec. 26, 1975, 75 39802
Int. Cl.[3] C08K *3/16, 5/13, 5/55*
U.S. Cl. 524—425

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–18** are cancelled.

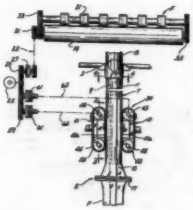
[1. A self-hardening composition of molded materials comprising at least one inert charge, either granular or pulverulent, intimately mixed with at least one organic resin as a binding agent, and with at least one acid or alkaline agent for the hardening of the binder, said composition containing between about 0.01 to 5% by weight, with reference to said binding agent, of fluoride ions, said amount being sufficient to catalyze the hardening of said resin.**]**

B1 4,288,965 (323rd)

FORM-FILL-SEAL PACKAGING METHOD AND APPARATUS

Robert C. James, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Reexamination Request No. 90/000,506, Feb. 17, 1984.
Reexamination Certificate for Patent No. 4,288,965, issued Mar. 26, 1985, Ser. No. 69,828, Aug. 27, 1979.
Int. Cl.[3] B65B *9/06, 57/04*
U.S. Cl. 53—451



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–32** are cancelled.

New claims **33–42** are added and determined to be patentable.

33. The method of forming, filling and sealing packages comprising:

intermittently pulling a web of flexible packaging material from a supply and measuring successive package length increments of the web as it is pulled from the supply to establish the package length with accompanying intermittent forward feed of the web in said package length increments on successive feed cycles to means for forming the web into tubing with the tubing surrounding a downwardly extending tubular mandrel;

said pulling, measuring and feeding of the web being effected by intermittently applying a forwarding force to the web between the supply and the forming means to feed a package length increment of the web forward;

intermittently pulling the tubing down on the mandrel during each feed cycle at the same time that each package length increment of the web is intermittently fed forward to the forming means;

said downward pulling of the tubing being effected by applying a separate and downward force to the tubing such as to pull the web over the forming means under sufficient tension to maintain it taut;

the tubing being thereby intermittently drawn down on the mandrel in a package length increment and intermittently fed downwardly off the lower end of the mandrel in a package length increment on each feed cycle;

the tubing being intermittently sealed below the lower end of the mandrel at package length intervals by sealing means which is opened for the downward feed of the tubing on each feed cycle and closed on a dwell of the tubing between successive feed cycles;

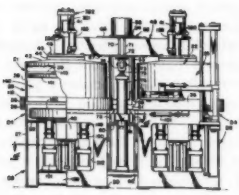
product to be packaged being delivered downwardly through the mandrel and out of its lower end into the lower end of the tubing;

the measurement of the package length increments of the web to establish the package length being effected solely before the forming of the web into the tubing and independently of the drawing down and sealing of the tubing thereby to form seals spaced with respect to the tubing a distance depending solely on said measurement.

B1 4,332,536 (324th)
HYDRAULIC TIRE PRESS

Anand P. Singh, Youngstown, Ohio, and Daniel Schichman, Trumbull, Conn., assignors to NRM Corporation, Akron, Ohio

Reexamination Request No. 90/000,391, Jun. 6, 1983.
Reexamination Certificate for Patent No. 4,332,536, issued Jun. 1, 1982, Ser. No. 138,589, Apr. 9, 1980.
Int. Cl.³ B29H *5/02, 5/08*
U.S. Cl. 425—33



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–25** and **35–42** is confirmed.

Claim **26** is determined to be patentable as amended.

Claims **27–34**, dependent on an amended claim, are determined to be patentable.

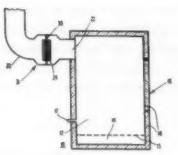
New claims **43–46** are added and determined to be patentable.

26. A tire press comprising a press base, a bottom mold section mounted for limited vertical movement on said press base, a center mechanism in said press base, a top mold section removably [positioned] *positionable* on said bottom mold section, means vertically to move said top mold section to open and close said press, *said bottom and top mold sections including respective mold parts and means to heat said mold parts to a high temperature for cure of a tire located between the mold parts,* mechanical lock means exterior only of the top mold section operative when engaged to hold said top mold section to said press base against vertical movement and within a short clamp-distance of said bottom mold section when said press is closed, [and] hydraulic lock means directly to urge said bottom mold section against said top mold section through such short clamping distance under high pressure after said mechanical lock means is engaged, said hydraulic lock means including multiple short stroke piston-cylinder assemblies connected between said bottom mold section and press base and arranged around the center mechanism beneath the bottom mold section, *and heat isolation means located between said bottom mold section and piston-cylinder assemblies for protecting the hydraulic fluid of said hydraulic lock means from heat degradation due to the high temperature of said mold parts.*

B1 4,345,528 (325th)
WOOD BURNING STOVE

Roger A. Allaire, Big Flats, and Robert V. VanDewoestine, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Reexamination Request No. 90/000,512, Feb. 27, 1984.
Reexamination Certificate for Patent No. 4,345,528, issued Aug. 24, 1982, Ser. No. 173,156, Jul. 28, 1980.
Int. Cl.³ F23J *15/00*
U.S. Cl. 110—203



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–6** is confirmed.

1. A wood burning stove comprising:
a combustion chamber with an access door;
a flue in communication with said combustion chamber for removing exhaust therefrom;
a catalytic converter means for removing oxidizable species from said exhaust, said catalytic converter means having a honeycomb structure having a plurality of catalytically active passageways extending therethrough and being rotatably mounted in and transversely across said flue whereby impedance to said exhaust caused by said converter means may be selectively maximized when the

longitudinal axes of said passageways are parallel to the longitudinal axis of the flue and minimized when the longitudinal axes of said passageways are perpendicular to the longitudinal axis of said flue; and

means for moving said converter means between positions of said converter means substantially extending transversely across said flue and of said converter means insubstantially extending across said flue, said means for moving said converter means comprising axial means extending transverse of said flue and on which said converter means is mounted for rotation between positions of said converter means substantially extending transversely across said flue with said passageways parallel to the longitudinal axis of the flue and of said converter means insubstantially extending transversely across said flue with said passageways perpendicular to the longitudinal axis of said flue.

REISSUES

MARCH 26, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

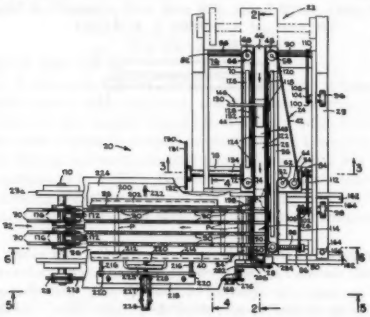
Re. 31,853
PACKAGE FLAP FOLDING APPARATUS

Jerome J. Vande Castle, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Original No. 4,079,572, dated Mar. 21, 1978, Ser. No. 778,657, Mar. 17, 1977. Application for reissue Sep. 14, 1978, Ser. No. 942,233

Int. Cl.[3] **B65B** *57/00, 51/00*

U.S. Cl. 53—53 **22 Claims**



20. An apparatus for receiving elongated filled packages with extended end flaps from a wrapping machine and thereafter folding the end flaps of only properly formed packages against the ends of the body of the packages comprising: feed conveying means including a pair of *opposed* endless belts for frictionally engaging opposite side walls of the packages *therebetween* ep for moving the packages along a first path in a direction parallel to the longitudinal axis of the packages *toward a transfer station wherein one of said belts terminates short of said transfer station while the other extends into said transfer station and thereby tends to controllably feed the packages to said transfer station*, a first slide plate for supporting the packages as they are moved by said belts, and defective package rejecting means for forcibly deflecting defective packages from said first path; flap folding means including a [slotted] *second* slide plate *being slotted and* having a flat portion and an arcuate input end, endless folding conveyor means having a plurality of lugs spaced at even intervals therealong and projecting through the slots in said [slotted] *second* slide plate for engaging the packages received from the feed conveyor and for moving packages along a second path in a direction normal to the longitudinal axes of the packages, folding means on opposite sides of said second path positioned to engage the end flaps and fold them rearwardly as each package moves therepast; and means defining a transfer [section] *station* between said feed conveying means and said flap folding [conveyor] *means* including a slotted deadplate disposed in planar alignment with said first slide plate and at an elevation lower than that of the flat portion of said second slide plate for receiving and supporting the packages discharged from said first slide plate *wherein the slots of said deadplate are of such dimension that the packages bridge said slots when located on said deadplate,* and an abutment means for terminating movement of the packages *into said transfer station* received from said feed conveying means in position to be accepted by the lugs of said folding conveyor means, said folding conveyor means being effective to pivot the packages 90° as the packages are moved [around] *over* the arcuate portion of said [slotted] *second* side plate.

Re. 31,854
FRONT DERAILLEUR FOR A BICYCLE

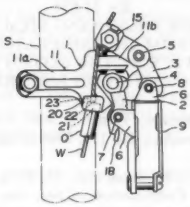
Tetsufumi Egami, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Original No. 4,279,605, dated Jul. 21, 1981, Ser. No. 70,650, Aug. 28, 1979. Application for reissue Jul. 14, 1983, Ser. No. 513,669

Claims priority, application Japan, Sep. 13, 1978, 53-126654; Oct. 26, 1978, 53-147828

Int. Cl.[3] **F16H** *7/22, 11/08*

U.S. Cl. 474—82 **8 Claims**



8. A front derailleur comprising:

a base member;

a pair of linkage members pivotally supported to said base member;

a movable member pivotally supported to said linkage members and having a chain guide;

a holder for a control wire provided at one of said linkage members; and,

a support for an outer sheath guiding said control wire provided at said base member, said support being mounted to a mounting nose extending from said base member and having a socket for receiving therein one end of said outer sheath, said mounting nose having an insertion bore for said control wire, said socket having at the bottom thereof an insertion bore for said control wire, and a guide slot directly connected to and in continuation of said insertion bores and extending radially thereof, said guide slot having a width substantially equal to the diameter of said insertion bores extending in the same direction of swinging movement of the linkage members and being larger in length than the maximum wire deflection created when a control wire having no outer sheath is used to operate said derailleur.

Re. 31,855
TEAR APART CANNULA

Thomas A. Osborne, Bloomington, Ind., assignor to Cook, Inc., Bloomington, Ind.

Original No. 4,306,562, dated Dec. 22, 1981, Ser. No. 173,960, Jul. 31, 1980. Continuation of Ser. No. 965,703, Dec. 1, 1978, abandoned. Application for reissue Nov. 22, 1982, Ser. No. 443,321

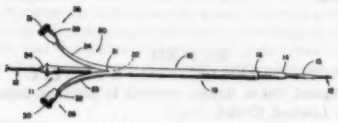
Int. Cl.[3] **A61M** *25/00*

U.S. Cl. 604—161 **16 Claims**

11. A cannula comprising:

a tube of flexible material compatible for insertion within the body and having the physical property of molecular orientation allowing a tear in said material to run readily only in a longitudinal direction along the length of the tube, said tube being soft and flexible from its inner diameter to its outer diameter and tapered at one end adapted for insertion within the body; a first tab on one side of the end of said tube oppo-

site said one end and a second tab on the other side of said opposite end of said tube whereby, when said tabs are pulled



apart said tube tears longitudinally separating said tube from any object within said tube.

Re. 31,856

PROCESS FOR PRODUCING FILM AND SHEET MATERIALS FROM THERMOPLASTIC MATERIALS HAVING HOT TACK BY THE BLOWN FILM PROCESS AND THE FILM AND SHEET MATERIALS THEREBY OBTAINED

Heinrich Pannenbecker, Postfach 340, 5200 Siegburg, and Rudolf Plate, Postfach 140 171, 5300 Bonn, both of Fed. Rep. of Germany

Original No. 3,880,691, dated Apr. 29, 1975, Ser. No. 236,297, Mar. 20, 1972. Continuation of Ser. No. 139,088, Apr. 10, 1980, abandoned. Application for reissue Dec. 11, 1981, Ser. No. 329,853

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1971, 2114065

Int. Cl.³ B29F *3/10*

U.S. Cl. 156—244.14 **5 Claims**

19. A process for production of film of hot-tacky thermoplastic material by the blown film process, which hot-tacky material is selected from the group consisting of polyurethanes and copolyamides, having a softening temperature higher than tacky saran up to 280° C.; being extrudable at temperatures of 180° C. and higher; and which is tacky to the extent that in production thereof by the blown film process, wherein a tube of the material is independently extruded, the extruded tube inflated and thereafter flattened with squeeze rollers so that walls of the tubing are superimposed, the superimposed walls become bonded together;

said process comprising the steps of extruding two tubes, one outside the other to produce a two ply tube having an inner ply and an outer ply; inflating the two ply tube, and thereafter flattening the two ply tube from the squeeze rollers, the inner ply being a tack-free thermoplastic material having a softening temperature which is about 10° C. to 80° C. lower than that of the hot-tacky material; slitting the flattened two ply tube; and winding the split two ply tube into a roll wherein hot-tacky and tack-free turns alternate.

PLANT PATENTS

GRANTED MARCH 26, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,421

APPLE TREE—"EVE'S DELIGHT"

Daniel A. Hanners, P.O. Box 475, Hood River, Oreg. 97031

Filed Feb. 2, 1983, Ser. No. 464,599

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of Apple tree substantially as herein shown and described, characterized particularly as to novelty by the unique combination of very large fruits, attractive color similar to striped or partially red Delicious variety, fruit having resistance to scab and mildew, with less bitter pit as compared to Yellow Newtown and Golden Delicious, the tree being vigorous, upright but spreading and having good crotch angles, adapting well to central leader training.

5,422

PEACH TREE

Richard C. Whaley, Davisboro, Ga., assignor to Washington Farms Limited, Newport Beach, Calif.

Filed May 25, 1983, Ser. No. 497,829

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, called, "June Freestone," substantially as illustrated and described, which is very large in size, very vigorous, spreading, moderately open, vase formed, and hardy; foliated with medium size acuminate, lanceolate, acutely pointed, thin, dark green leaves having a crenate, finely serrate margin and a short, thick petiole, and a very productive bearer of uniform evenly ripening, large to medium size, nearly globose or very broadly ovate, freestone fruit having yellow skin substantially overspread with red and firm, fine, crisp, meaty, yellow flesh streaked with red; the variety being more particularly characterized, in comparison to Harvester or Red Globe varieties, by fruit that typically ripens in early June in the Ridge region of Georgia (while Harvester or Red Globe varieties ripen in late June or early July in that region), averages slightly larger in size, has fewer split pits, is rounder, more symmetrical, and more firm of flesh, and has good shipping quality.

5,423

GARDINER PEACH TREE

Ronald E. Smith, Rte. 1, Box 347D, Leesburg, Va. 22075

Filed Sep. 8, 1983, Ser. No. 530,260

Int. Cl.[3] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, as illustrated and described, which is a regular and productive bearer of large size, freestone fruit, with firm flesh, attractive skin, having an attractive red blush color and of good fresh eating and canning quality.

PATENTS

GRANTED MAR. 26, 1985

ERRATA

For CLASS	See PATENT NO.
016–048	4,506,407
211–059	4,506,796
384–569	4,506,936
534–695	4,507,124
534–634	4,507,236
514–140	4,507,284
514–023	4,507,286
514–043	4,507,287
514–143	4,507,288
514–170	4,507,289
514–172	4,507,290
514–278	4,507,291
514–183	4,507,292
514–226	4,507,293
514–249	4,507,294
514–212	4,507,296
514–252	4,507,297
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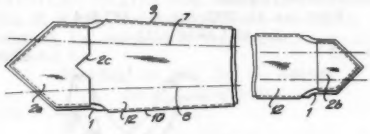
514–510	4,507,316
514–531	4,507,317
514–531	4,507,318
514–546	4,507,319
514–605	4,507,320
514–673	4,507,321
514–648	4,507,322
514–649	4,507,323
428–375	4,507,324
521–101	4,507,416
427–048	4,507,457
525–507	4,507,460

PATENTS

GRANTED MARCH 26, 1985

GENERAL AND MECHANICAL

4,506,389
TIE CONSTRUCTION
Stanley Franklin, Northridge, Calif., assignor to Briar Neckwear, Inc., Los Angeles, Calif.
Filed Sep. 27, 1982, Ser. No. 425,037
Int. Cl.³ A41D *25/16*
U.S. Cl. 2—144 **6 Claims**



1. A tie construction, comprising

a front tie material of elongated shape having end portions including tips,

tipping pieces having a periphery complementary to each end portion of said front tie material, said tipping pieces being peripherally flanged and peripherally stitched to an inwardly flanged periphery of the end portions of said front tie material so as to form pockets in cooperation with said end portions of said front tie material,

a support layer having a periphery extending substantially along the entire periphery of the front tie material from tip to tip longitudinally as well as laterally, having substantially the same size and shape as the front tie material, being substantially complementarily positioned on the inside of said front tie material, and end portions of said support layer freely extend into said pockets, respectively, with the periphery of said support layer in said pockets being free and unsecured,

a lining having a periphery smaller than that of the front tie material and substantially the same as that of the tie to be produced and formed substantially parallel to the periphery of said front tie material and positioned against said support layer in the tie, and end portions of said lining freely extending into said pockets, respectively, with the periphery of said lining in said pockets being free and unsecured,

means for connecting said lining to both said front tie material and to said support layer along abutting opposite longitudinally extending peripheral edge portions of said front tie material and said support layer exclusively at the inside of the tie, said connection means extending between and excluding said pockets.

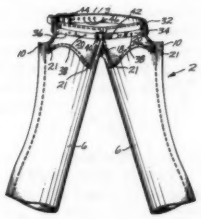
4,506,390
MATERNITY GARMENT
Marilyn M. Stern, Washington, D.C., assignor to Ninth Moon, Washington, D.C.
Filed Feb. 29, 1984, Ser. No. 584,874
Int. Cl.³ A41D *1/14*
U.S. Cl. 2—221 **6 Claims**

1. A maternity garment comprising:

a tube-like waistband portion having a front and back and a vertical extent which is narrower at said back and wider at said front, said waistband portion having a pouch-like vertical extension at said front and being elastic and expandable and contractable only in a radial direction; and

a body portion connected with and extending downwardly from said waistband portion, said body portion forming the configuration of said garment.

4,506,391
CHAPS
Fred K. Rodman, 16441 12th Ave. South, Seattle, Wash. 98148
Filed May 19, 1983, Ser. No. 495,990
Int. Cl.³ A41D *1/06*
U.S. Cl. 2—227 **13 Claims**



1. A pair of chaps for use when riding a motorcycle, a horse, or the like, comprising two leg portions, two upper portions, means for limiting movement of said upper portions with respect to each other, and means for supporting the chaps in position on a wearer; each of said leg portions extending downwardly from a different one of said upper portions and being positioned to cover at least the front and part of the sides of a wearer's leg; one of said upper portions including front flap means and the other of said upper portions including front edge means, with one of said flap and edge means slidably overlapping the other of said flap and edge means to cover the abdomen of a wearer; wherein when a wearer moves one leg with respect to the other leg, the flap means and the edge means slide with respect to each other to allow the wearer freedom of movement; and wherein the amount of overlap of the flap and edge means is sufficient to maintain the flap and edge means in an overlapping position when the wearer mounts and dismounts a motorcycle or a horse.

4,506,392

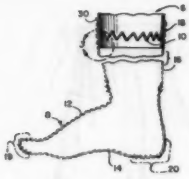
ATHLETIC UNDERGARMENT

Alice C. White, 105 Pulis Ave., Franklin Lakes, N.J. 07417

Continuation-in-part of Ser. No. 175,729, Aug. 6, 1980, Pat. No. 4,368,546. This application Dec. 23, 1982, Ser. No. 452,762

Int. Cl.³ A41B *11/00*

U.S. Cl. 2—239 10 Claims



1. An athletic undergarment for providing circulatory stimulation and muscle support to the wearer's legs and for protecting and comforting the wearer's feet while preventing relative slippage between the feet and the wearer's shoes, said athletic undergarment comprising at least one leg portion formed from resiliently elastic material which terminates at a point above the wearer's foot and a foot portion formed from a heavy, compressible knit material which is secured to the leg portion such that the foot portion completely surrounds the wearer's foot to provide gripping surfaces along the top and bottom thereof for resisting slippage inside the wearer's shoe while permitting transpirational removal of perspiration from the wearer's foot, said foot portion including an ankle section and said leg portion being permanently secured to the interior surface of said foot portion by stitching.

4,506,393

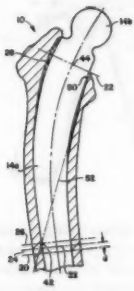
METHOD OF PROSTHESIS DESIGN

Stephen B. Murphy, 10 Dartmouth St., Winchester, Mass. 01890

Filed Mar. 29, 1983, Ser. No. 480,007

Int. Cl.³ A61F *1/00*

U.S. Cl. 3—1 13 Claims



10. The method of fitting a prosthesis to a body canal which is to encompass it comprising the steps

A. forming a computer image of the canal

B. forming a computer image of the prosthesis generally conforming to the canal,

C. withdrawing said prosthesis from the canal by a predetermined amount,

D. positioning one end of the prosthesis on a first contact point of a path along the canal wall along which said end is to move during withdrawal,

E. rotating the prosthesis about an axis defined by selected reference points on the upper and lower portions of said prosthesis and calculating the volume interference between the prosthesis and the canal for each of a plurality of positions about said axis,

F. selecting the minimum interference volume and redefining the prosthesis image by removal of said volume therefrom;and

G. repeating the steps of paragraph C through F until the prosthesis can be withdrawn without further interference.

4,506,394

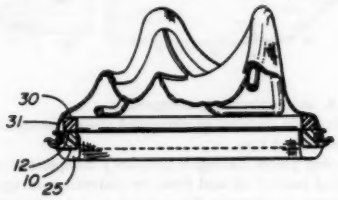
CARDIAC VALVE PROSTHESIS HOLDER

Pierre Bédard, Nepean, Canada, assignor to Molrose Management, Ltd., Ontario, Canada

Filed Jan. 13, 1983, Ser. No. 457,514

Int. Cl.³ A61F *1/22*

U.S. Cl. 3—1.5 6 Claims



1. An implantable device for receiving and removably holding in place a cardiac valve prosthesis comprising a substantially ring-shaped structure provided with means allowing the strucutre to be securely attached to heart tissue and with a plurality of hooks connected to the generally radially outwardly facing portion of the structure and adapted for receiving and retaining a sewing skirt of a valve prosthesis for removably connecting a valve prosthesis to said structure, and a flange connected to the radially outwardly facing portion of the structure and extending substantially radially outwardly.

4,506,395

PROSTHETIC FOOT

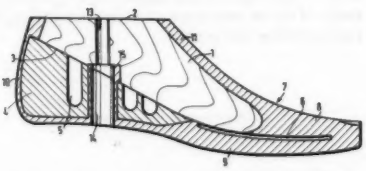
Werner Haüpt, Duderstadt, Fed. Rep. of Germany, assignor to Otto Bock Orthopädische Industrie KG, Duderstadt, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 545,731

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 3309777

Int. Cl.³ A61F *1/08*

U.S. Cl. 3—6 10 Claims



1. A prosthetic foot comprising a core extended in an ankle area and an instep area and securable to a bone of a user, and formed of incompressible material, said core having a bottom surface sloping substantially rearwardly and upwardly toward a rear end of the foot; a wedge-shaped heel element attached to said bottom surface and formed of a soft and elastic material; and a water-resistant casing portion which forms a toe portion and a sole positioned below said heel element and said core, said casing portion laterally completely covering said heel portion and said core and being formed of a medium-hard, elastic synthetic plastic material, the foot being provided with a vertical steplike bore for receiving therein means for securing

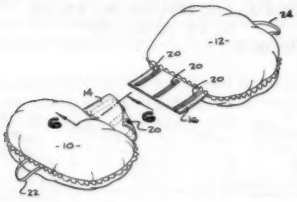
the foot to the bone of the user, said bore extending from an upper surface of said core through each of said core, said heel element and said sole, said bore having a portion of enlarged diameter in said heel element, walls of said enlarged portion being completely covered with said medium-hard synthetic plastic material of said casing portion so that said casing portion forms a seamless envelope extending out of said bore and completely laterally surrounding said core and said heel element, thereby sealing said foot from moisture and corrosion.

4,506,396

COMFORT PILLOW FOR PREGNANT FEMALES

William B. Ritchie, Jr., and Marguerite M. Ritchie, both of Richmond, Va., assignors to The Ritchie Family Company, Richmond, Va.

Filed Mar. 29, 1983, Ser. No. 480,943
Int. Cl.³ A47G 9/00
U.S. Cl. 5—431 **7 Claims**



1. A comfort enhancing assembly sized for providing abdominal and back support for a pregnant female comprising

a first pillow of generally oval configuration and

a second pillow of generally oval configuration and transverse cross-section,

a first flexible connector panel extending from one side of said first pillow generally midway the height of said first pillow,

a second flexible connector panel extending from one side of said second pillow generally midway the height of said second pillow and being in overlapped relation with said first flexible connector panel,

first handle means extending outwardly from the side of said first pillow opposite first connector panel,

second handle means extending outwardly from the side of said second pillow opposite said second connector panel, and

interengaging connecting means on one side of each of said connector panels, said connecting means on first connector panel being in position for engaging said interengaging connecting means on said second connector panel when said panels are in overlapping relationship with the sides thereof including said interengaging connecting means facing each other and permitting connection of said panels in a multiplicity of positions for obtaining a multiplicity of spacings between said pillows so as to provide optimum comfort for a user,

each of said connector panels extending along the respective said one side of a said pillow for a major portion of the length of said one side and outwardly from the respective one of said pillows a sufficient distance to allow said first and second pillows to be spaced relatively close to each other when said panels are substantially overlapped and relatively far apart when said panels are only partially overlapped,

each of said connector panels comprising a stiffener for maintaining the shape of the panel without loss of flexibility, and a fabric covering overlying each side of said stiffener, and

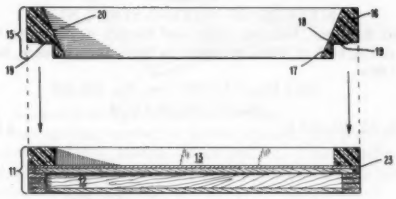
the portions of said pillows facing each other when said connecting panels are connected together being substantial mirror images.

4,506,397

WATERBED CONSTRUCTION

Isaac Fogel, Silver Spring, and Donald W. Keefer, Pasadena, both of Md., assignors to Classic Corporation, Jessup, Md.

Filed Apr. 1, 1983, Ser. No. 481,248
Int. Cl.³ A47C 27/08
U.S. Cl. 5—451 **16 Claims**



1. A waterbed comprising:

a foundation having a rigid horizontally extending base and a rigid support member of subtantially rectangular cross section fixed on the periphery of the upper surface of said base and substantially laterally completely enclosing a space on said base;

a fluid-filled mattress of greater height than the height of said support member resting on said base in said space within said support member; and

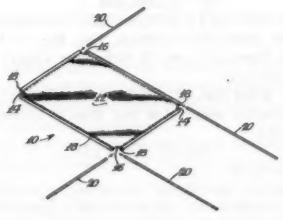
an annular cushion interlocked between the sides of said mattress and said support member, said cushion including an upper portion resting on the top surface of said support member, a lower portion resting on said base and against the interior face of said support member, an integral flexible connection between said upper and lower portions for enabling said upper portion to be pivoted away from the top surface of said support member for insertion of the edge of bedclothes therebetween, and a restraining member of L-shaped cross section secured to said upper and lower portions across said flexible connection and overlying at least a portion of said top surface and interior face of said support member to prevent bowing of said annular cushion by hydrostatic pressure exerted thereon by said fluid-filled mattress.

4,506,398

WATER BED SHEET

Mark Hruban, Eight S. 114 Vine St., Hinsdale, Ill. 60521

Filed Sep. 26, 1983, Ser. No. 535,438
Int. Cl.³ A47C 27/08; A47G 9/02
U.S. Cl. 5—451 **7 Claims**



1. A bed sheet for a water bed having a bed frame with rigid sidewalls and a fluid-filled bladder supported in said bed frame wherein the flexible peripheral wall of said bladder bears against said rigid sidewalls, said bed sheet comprising:

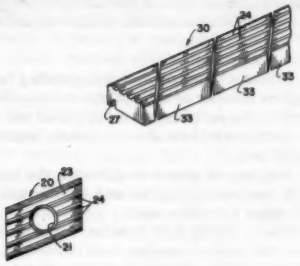
a central portion for covering the top of said bladder;
lateral and end extensions projecting from said central portion;
pocket means at the extremities of said extensions; and
elongated rigid means removably inserted into said pocket means so that each inserted rigid means is independent of and disconnected from the others, whereby when said extensions are draped over said bladder the bladder peripheral wall cooperates with said rigid bed frame walls to positively grip each of said rigid means therebetween.

4,506,399

METHOD OF MAKING STRUT NUTS

Carl R. Espey, Fairview Park, and Barney A. Andrews, Wadsworth, both of Ohio, assignors to Nuts, Incorporated, Seville, Ohio

Filed May 23, 1983, Ser. No. 496,895
Int. Cl.³ B21D *53/24*
U.S. Cl. 10—86 R **1 Claim**



1. A method for making a nut adapted for use in combination with a structural member having in one face a longitudinal slot bordered by inwardly projecting flanges, the nut being adapted to be positioned in the slot with portions thereof in gripping engagement with the ends of said flanges and being adapted to receive an externally threaded fastening member, comprising the steps of:
cold rolling a strip of deformable hardenable metal to form a plurality of longitudinally extending parallel ridges and grooves, each ridge defining a relatively sharp edge along the top thereof, said rolling producing sufficient force and deformation to harden said strip;
cutting the resulting cold rolled strip diagonally thereacross at uniformly spaced locations to form a plurality of rhomboid-shaped nut blanks with parallel hardened serrations on one face; and
tapping the resulting nut blanks to form a nut.

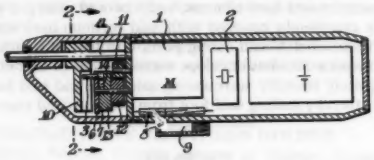
4,506,400

ELECTRICALLY OPERATED TOOTHBRUSH

Horst Klein, Kelkheim-Fischbach, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,302
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244262
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—22 R **4 Claims**

1. An electric toothbrush comprising a reversible electric motor with means to reverse the motor, a rotatable toothbrush holder with a lever secured thereto having a radial slot therein, and means interconnecting the lever with the electric motor for oscillating the lever and the toothbrush holder, the means including a radially slidable pin connected to rotate with the motor, the pin having a variable circular orbit and a free end positioned in the lever slot to oscillate the lever and toothbrush holder as the pin rotates about its circular orbit, and means to radially shift the pin when the motor is reversed to thereby



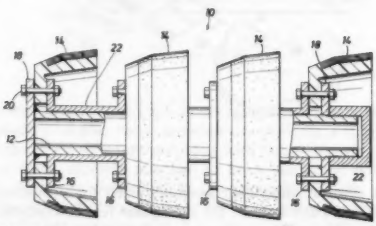
vary the circular orbit of the pin which in turn varies the amplitude of oscillation of the lever and toothbrush holder.

4,506,401

BRISTLE PIG CUP

Kenneth M. Knapp, 1209 Hardy, Houston, Tex. 77020

Filed Jan. 16, 1984, Ser. No. 570,994
Int. Cl.³ B08B *9/04*
U.S. Cl. 15—104.06 R **7 Claims**



1. An improved pipeline cleaning mechanism comprising:
(a) an elongate supporting mandrel having a specified length and adapted to receive and support thereon at least a pair of mountable cups; and
(b) wiper cups mountable on said mandrel, said cups having a peripheral lip around a central transverse webb within said lip, said cup being formed of a resilient material sized to fit within a pipeline and sufficiently flexible to forming an encircling sealing contact with the surrounding lip, and wherein said lip integrally comprises a stiffening means in said lip, and said stiffening means extends arcuately of said mandrel to stiffen said lip, and wherein said stiffening means is an elongate backing having a set of staples arranged to extend radially outwardly, and said lip is integrally cast around said staples, locating tips of said staples at or below the surface of said lip.

4,506,402

APPARATUS FOR CLEANING A DIPSTICK

Arvin R. Long, Jr., 4334 Rock Creek Rd., Alexandria, Va. 22306

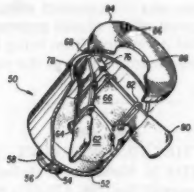
Continuation-in-part of Ser. No. 403,000, Jul. 29, 1982, Pat. No. 4,422,204. This application Dec. 20, 1983, Ser. No. 563,374
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.³ F01M *11/12*
U.S. Cl. 15—210 B **10 Claims**

1. Apparatus for cleaning a dipstick, said apparatus comprising:
(a) a cup-shaped member adapted to be mounted over the dipstick receiving orifice of a crankcase, said cup-shaped member having an opening in the bottom thereof positioned to act as a continuation of the dipstick receiving orifice and sized to pass the dipstick;
(b) an absorbent member removably placed in the bottom of said cup-shaped member, said absorbent member having an opening therethrough sized and positioned to closely

receive the dipstick but to allow the dipstick to pass therethrough;

(c) a pair of wiper lips mounted in said hollow cylindrical member;

(d) first means for biasing said wiper lips towards a position in which the dipstick can be passed therebetween without contacting said wiper lips;



(e) second means for moving said wiper lips against the bias of said first means into a position in which they will contact and wipe the dipstick as it is passed therebetween; and

(f) a cap mounted over the top of said cup-shaped member, said cap having an opening therein sized and positioned to permit the dipstick to pass through.

4,506,403

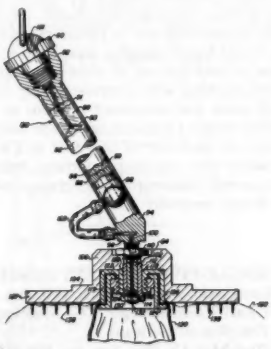
CLEANING APPARATUS

George S. Trisolini, Via Donatello 5, Palagino, Italy

Division of Ser. No. 385,819, Jun. 7, 1982, Pat. No. 4,464,809, which is a division of Ser. No. 212,634, Dec. 3, 1980, Pat. No. 4,344,201. This application Jun. 4, 1984, Ser. No. 616,857

Int. Cl.³ A47L *13/22*

U.S. Cl. 15—229 B **6 Claims**



1. A mop for use in a cleaning apparatus in which a mop wringer extracts matter from the mop by means of a rotating basket in the mop wringer, said mop comprising:

a handle;

a wiper mounted on the handle for rotation relative thereto; and

a head affixed to the handle, the head including a base and means mounting the wiper for rotation relative to the base, the base including a flange fixed against rotation for engaging the wiper to preclude rotation of the wiper relative to the handle when the wiper is wiped across a surface to be cleaned.

4,506,404

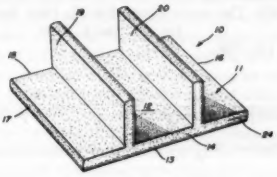
DISPOSABLE SPONGE

Ambrose W. J. Clay, P.O. Box 22642, Nashville, Tenn. 37202

Filed May 11, 1983, Ser. No. 463,039

Int. Cl.³ A47L *13/16*

U.S. Cl. 15—244 C **3 Claims**



1. A disposable sponge device comprising:

(a) a base sponge member of flexible material and predetermined thickness, having a face surface, a back surface, opposed end edge portions, and opposed side edge portions,

(b) first and second elongated upright sponge members of flexible material attached to and projecting from said back surface, said upright sponge members extending end-to-end of said base sponge member,

(c) said upright sponge members being spaced from each other and between said opposed side edge portions sufficiently that both said upright sponge members can be grasped and pulled toward and against each other by a single hand of the user of the sponge device, and

(d) an elongated slit formed in one edge portion of said base sponge member between said top and bottom surfaces and opening through at least said one edge portion, for receiving the edge of a blade for cleaning the blade.

4,506,405

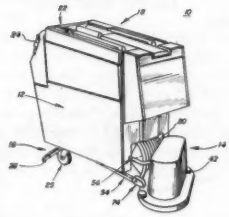
FLOOR TREATING MACHINE

Thomas S. Block, Muskegon, Mich., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 29, 1983, Ser. No. 537,730

Int. Cl.³ A47L *11/293*

U.S. Cl. 15—320 **19 Claims**



1. A floor treating machine for treating a floor having a frame structure, a brush housing operatively connected to said frame structure and rotatable floor treating brush means, said floor treating machine comprising:

a brush lifting means for selectively lifting the brush housing away from and lowering the brush housing towards said floor, and

a control means for operating said floor treating machine in a first mode wherein said brush means is rotated at a relatively high rotational speed and said brush lifting means automatically maintains said brush housing at a first position relative to said floor and a second mode wherein said brush means is rotated at a relatively slower rotational speed and said brush lifting means being infinitely

variable to vary the position and the pressure of said brush housing relative to said floor.

4,506,406

ATTACHMENT TOOL FOR A VACUUM CLEANER HOSE

Salvatore LaMonte, 920 Ward Ave., #8F, Honolulu, Hi. 96814

Continuation of Ser. No. 194,672, Oct. 6, 1980, Pat. No. 4,332,051. This application May 27, 1982, Ser. No. 382,580

Int. Cl.³ A47L *9/06*

U.S. Cl. 15—398 **6 Claims**

1. An attachment tool for a vacuum cleaner hose, comprising:

an elongated tubular housing having an end adapted for connection to a vacuum cleaner hose and an opposite end providing a flattened air intake opening,

the flattened face of said housing being formed to provide an elongated opening therethrough,

means on said housing formed for selectively covering said elongated opening for admitting air therethrough to the interior of said housing,

and elongated brush means carried on said flattened face of said housing and extending along said elongated opening in immediate proximity thereto,

said means for selectively covering said elongated opening comprising a flattened elongated rectangular panel mounted on said housing for endwise movement between a closed position fully covering said elongated opening and an open position uncovering said elongated opening,

said housing being formed with confronting grooves running along the longer opposite sides of said opening, with the longer side edges of said panel being slideably mounted in said grooves.

4,506,407

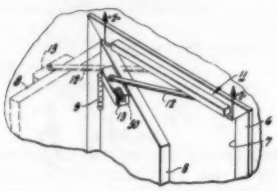
RELEASABLE HOLD-OPEN DEVICE FOR A DOOR CLOSER

William L. Downey, Peru, Ill., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jul. 18, 1983, Ser. No. 514,636

Int. Cl.³ E05F *15/20*

U.S. Cl. 16—48.5 **4 Claims**



1. A releasable hold-open device for a door closer interconnecting a door frame and a door panel movable relative to the door frame between closed and open positions comprising a spring for urging the panel toward said closed position, and comprising means movable in accordance with the movement of a door panel relative to said door frame, a follower movably joined to said movable means for only relative rectilinear motion therewith toward and away from a stop position, means on said movable means and on said follower for urging said follower toward said stop position, a latch engageable at one end with said follower and movable between a first position holding said follower in said stop position and a second position releasing said follower, an actuator directly engageable with another end of said latch and directly engageable with said follower and movable between one position holding said latch in said first position and another position free of said latch, means for resiliently urging said actuator toward said another position, a permanent magnet engageable with said actuator when said actuator is moved by direct engagement with said moving follower against said resilient urging means into said one position and having an effect to hold said actuator in said one position, an electromagnet effective when energized to overcome said effect of said permanent magnet and thereby releasing said door panel from being held in said open position and allowing the spring to urge the panel to the closed position.

4,506,408

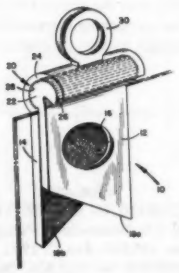
RATCHET HINGE STRUCTURE

Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205

Continuation-in-part of Ser. No. 428,637, Sep. 30, 1982, abandoned. This application Aug. 17, 1983, Ser. No. 523,950

Int. Cl.³ E05D *11/08, 3/02*

U.S. Cl. 16—225 **12 Claims**



6. A variable position hinge structure comprising a male member with a first set of alternately raised and non-raised portions, a female member with a second set of alternately raised and non-raised portions, said female member having a split along its longitudinal axis to permit radial expansion and contraction of said female member relative to said male member, a portion of said first set of alternately raised and non-raised portions meshing with a corresponding portion of said second set of raised and non-raised portions at various positions of relative rotation between said male member and said female member, at least one of said first and second sets of alternately raised and non-raised portions being resiliently deformable to permit relative rotation between said male member and said female member.

4,506,409

SINGLE-PIVOT CABINET HINGE

Gerhard W. Lautenschläger, Brensbach, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG, Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 494,093

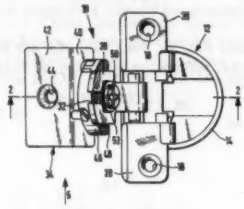
Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218375

Int. Cl.³ E05D *7/04;* **E05F** *1/10*

U.S. Cl. 16—238 **7 Claims**

1. A single-pivot cabinet hinge for a door leaf to be hung on a cabinet, said cabinet hinge being adapted to be moved from an open to a closed position and vice versa and having a pivot axis, and also having a door-related part in the form of a cup adapted to be set in a gain in the back of a door leaf, and a cabinet-related part with a mounting element adapted to be fastened on a cabinet, said hinge having a pivot arm with a first door-leaf end pivotally mounted in said cup and a second, cabinet end fastened releasably on said mounting element so as

to be adjustable in coordinate directions at right angles to one another, said mounting element having a mounting platform with a planar face, said second end being in the form of a planar fastening plate having a certain thickness, a fastening screw with a threaded shank of a certain diameter, for placing said plate into engagement with said planar face of said mounting platform, said mounting platform lying in the cup when the hinge is in the closed position, said fastening plate having a first slot disposed parallel to the hinge pivot axis, a projection having a certain width and engaging into said slot and protruding from the planar face of said mounting platform and having



a tap, said tap receiving the threaded shank of said screw, said projection being part of an adjusting element which is adjustable within a certain range, approximately at right angles to the hinge pivot axis, in said mounting platform and adapted to be locked at selected positions within said range, said adjusting element being a rocking lever journaled in a side of the mounting element facing the cabinet when attached thereto a free end of said rocking lever having said projection which is situated in a section of a recess opening onto said planar face of said mounting platform and which engages said first slot in said planar fastening plate.

4,506,410

APPARATUS FOR THE INTRODUCTION OF GIBLETS INTO THE BODY CAVITIES OF POULTRY

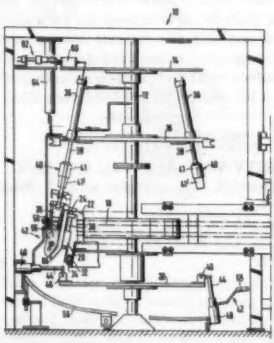
Heinrich W. Markert, Otterlo, Netherlands, assignor to Machinefabriek Markert B.V., Netherlands

Filed Mar. 16, 1982, Ser. No. 358,837

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144178

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—11 **12 Claims**



1. Apparatus for the introduction of poultry giblets into the evacuated body cavities of poultry comprising first conveying means for transporting birds suspended by the legs through an insertion region, second conveying means for conveying downwardly opening cups containing giblets through the insertion region in synchronism with the first conveying means, means in the insertion region for sequentially moving individual cups to individual birds as the cups and birds are passed through the insertion region in a manner permitting giblets to be expelled downwardly from the cups into the body cavities of the birds, plunger means having at least one plunger operable in the insertion region for moving into the cups and expelling giblets from respective cups into the body cavities of respective birds, and plunger control means for selectively operating the plunger means to expel giblets from a cup only if a bird is present at the insertion region to receive the giblets, said plunger control means including sensor means for detecting the presence of birds at the insertion region, and plunger operating means controlled by the sensor means to expel giblets from a cup only upon said detecting, said cups having laterally spreadable walls, said at least one plunger having a forward section and a larger diameter rear section, the diameters of the plunger sections being related to the cross-dimensions of the cups so that substantial spreading of the spreadable walls is caused by engagement of said rear section with the spreadable walls rather than by pressure of giblets expelled by said forward section.

4,506,411

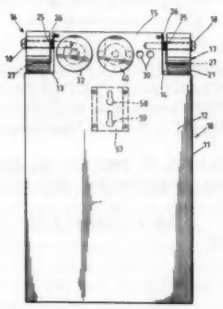
GAME SKINNING APPARATUS

James R. Ivy, 9001 Glacier #138, Texas City, Tex. 77590

Filed Dec. 27, 1983, Ser. No. 565,372

Int. Cl.³ A22C *1/00*; A22B *5/16*

U.S. Cl. 17—44.3 **9 Claims**



1. A game skinning rack comprising:

an elongated board;

cam means pivotally mounted on said board for gripping the extremities of an animal to be skinned; and

holding means positioned on said board and arranged to engage the neck of the animal, said holding means comprising a pair of spools and means for mounting said spools in any one of a plurality of laterally spaced positions with respect to one another where side surfaces of said spools snugly engage the neck of the animal.

4,506,412

FISH SKINNING AND SCALING TOOL

Marlin D. Hahn, 140 Edinburg St., San Angelo, Tex. 76902

Filed Nov. 30, 1983, Ser. No. 556,282

Int. Cl.³ A22C *25/02, 25/17*

U.S. Cl. 17—62 **2 Claims**

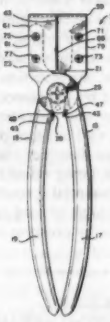
1. A fish skinning and scaling tool, comprising:

a pair of mating lever units, each of said lever units having a curved handle portion, an elongated jaw portion, and an intermediate disk-shaped portion, said lever units being pivotally joined at said intermediate disk-shaped portions;

biasing means for normally biasing said handle portions apart whereby said jaw portions are biased toward an open position;

each of said jaw portions having a right angle metal blade

mounted thereon and formed from a flat sheet of metal, said blades having interior edges which come together to form a gripping surface when said jaw portions are closed and said blades having depending edges which come together to form a scaling surface when said jaw portions are closed; and



wherein said blade interior edges oppose each other along the entire length of said blades by flat abutting surfaces when said jaw portions are closed and wherein said blade depending edges have outer extents which are beveled to form an obtuse angle with respect to a line drawn along the axis of the depending portion of each blade.

4,506,413
APPARATUS FOR REGULATING FIBER QUANTITIES SUPPLIED TO A TEXTILE MACHINE

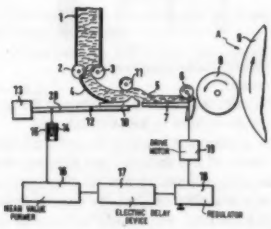
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Feb. 18, 1983, Ser. No. 467,600

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205776

Int. Cl.³ D01H *5/38*

U.S. Cl. 19—105 **10 Claims**



1. In an apparatus for regulating fiber quantities supplied to a textile machine as a fiber layer of indeterminate length and determinate width, including sensor means for mechanically sensing thickness variations of said fiber layer at a plurality of locations along said width and emitting individual mechanical signals representing the magnitude of thickness variations at each location; and fiber layer delivery means; the improvement comprising

(a) transducer means connected to said sensor means for converting each individual mechanical signal into an individual electric signal;

(b) signal adding means connected to said transducer means for combining the individual signals into a joint electric signal;

(c) regulator means connected to said signal adding means for comparing said joint electric signal representing an actual value with a predetermined desired value of fiber layer thickness for generating a setting signal; and

(d) setting means connected to said regulator means and said fiber layer delivery means for controlling said setting means by said setting signal whereby fiber quantities of said fiber layer are regulated as a function of said thickness variations of said fiber layer.

4,506,414
YARN-DRAFTING APPARATUS

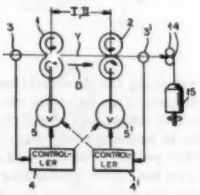
Klaus E. Krieger, Kirchheim, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Feb. 11, 1983, Ser. No. 465,991

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205880

Int. Cl.³ D01H *5/32*

U.S. Cl. 19—240 **8 Claims**



1. In combination with a yarn spinner, a yarn-drafting apparatus comprising:

an upstream gripper roller assembly including at least an upstream roller pair gripping the yarn to be drafted;

a downstream gripper roller assembly including at least a downstream roller pair spaced from the upstream pair and also gripping the yarn; wherein the improvement comprises:

respective variable-speed drive means connected to the upstream and downstream pairs for rotating same substantially independently of each other at respective slow upstream and fast downstream speeds and thereby passing the yarn from the upstream to the downstream pair while drafting the yarn;

respective upstream and downstream sensor means juxtaposed with the yarn adjacent the upstream and downstream roller pairs for determining the yarn size; and

respective upstream and downstream control means connected to the respective sensors and drive means for rotating the respective roller pairs at speeds dependent substantially only on the respective detected yarn sizes.

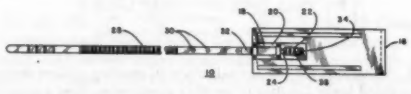
4,506,415
SECURITY SEAL AND TAG HOLDER

Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jul. 25, 1983, Ser. No. 516,653

Int. Cl.³ B65D *63/00, 27/30*

U.S. Cl. 24—16 PB **4 Claims**



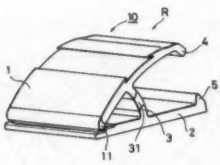
1. A security seal comprising a housing formed by side walls and a top, said top being hinged to the side walls and movable about the hinge from an initially open position to a closed position, said housing and said top having latch means for

retaining the top in the closed position, and a shackle extending from the housing, said shackle being insertable through the housing to form a shackle loop, said shackle and said housing having interengaging means for preventing reverse movement of the shackle after it has been pulled through the housing, in which said shackle has means positioned and dimensioned to bear against the top of the housing to maintain said top in the closed position when the shackle is drawn through the housing.

4,506,416
PAPER CLIP

Kiyoshi Ohminato, Chiba, Japan, and Kenzo Miyamoto, deceased, late of Tokyo, Japan (by Toshiko Miyamoto, executor), assignors to King Jim Co., Ltd., Japan

Filed Feb. 9, 1983, Ser. No. 465,289
Int. Cl.³ B42F *1/02*
U.S. Cl. 24—67 R **7 Claims**

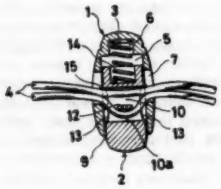


1. A paper clip comprising a unitary flat bottom member having a paper engaging end and a handle end, a convexly arcuate movable top member having a paper-engaging end and a handle end, and an arcuate web joining the top and bottom members intermediate their ends, said top and bottom members being normally biased such that said paper-engaging ends are in contact with each other, said paper-engaging end of said top member and the central portion of said web being formed of a soft synthetic resin, the remainder of said paper clip being formed of a hard synthetic resin.

4,506,417
FASTENER FOR STRING

Kunio Hara, Kawasaki, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed May 6, 1983, Ser. No. 492,275
Int. Cl.³ F16G *11/00*
U.S. Cl. 24—115 G **7 Claims**

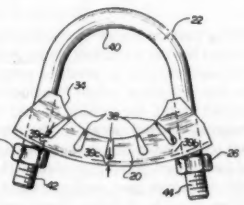


1. A string fastener, comprising a one-piece housing internally provided with a blind cavity opening in one end of said housing and said cavity having a substantially uniform configuration from one end to the other end, a sliding member having a complimentary external configuration to said cavity slidably admitted into said blind cavity of said housing, and a spring disposed within said cavity of said housing and serving to energize said sliding member outwardly, said housing and sliding member being respectively provided laterally therein with perforations adapted so as to come into mutual coincidence when said sliding member is pushed into said housing against the energizing force of said spring and said housing and sliding member also being respectively provided laterally therein with insertion slots adapted so as to communicate with said perforations and to come into mutual coincidence when said perforations are brought into mutual coincidence, at least one engaging projection in the shape of a check claw extending outwardly from the sliding member adjacent the upper edge of said opening of the perforation in said sliding member and projecting into the perforation in said housing and adapted to limit the axial sliding movement of said member by said projection engaging the lower surface of the perforation in said housing, wherein said string fastener secures a given string in position by causing said sliding member to be pushed into said housing until said perforations and said insertion holes come into mutual coincidence, inserting opposed end portions of said string via said insertion holes into said perforations, and relieving said sliding member of the pressure used for said pushing.

4,506,418
MUFFLER CLAMP

Frank J. Viola, Uniondale, and Anthony Scaduto, Brooklyn, both of N.Y., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 20, 1982, Ser. No. 450,873
Int. Cl.³ B65D *63/00*; F16L *33/10*
U.S. Cl. 24—277 **14 Claims**



1. A clamp comprising:

a bracket having first and second walls that are maintained in spaced-apart relation by a base member and that have a central region located between opposite ends, said first and second walls each having a planar surface and an edge that is remote from said base member and that has a generally concave contour, said first and second walls each further having a plurality of sections in the planar surface thereof, said sections extending inwardly from the concave edge toward said base member with the portions of said first and second walls between said base member and the closed end of said sections being lowest in the central region of said walls and highest adjacent the ends of said walls, such that the plurality of sections are closed together as the base member is flexed inwardly;

a retainer having a curved central region located between two distal ends, said central region having a radius of curvature substantially equal to the radius of curvature of the concave edge of said bracket; and

fastening means for securing said retainer to said bracket adjacent the distal ends.

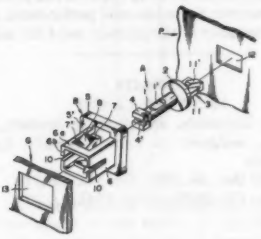
4,506,419
PART-FIXING CLIP

Seiji Mitomi, Chigasaki, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jul. 20, 1983, Ser. No. 515,719
Claims priority, application Japan, Aug. 20, 1982, 57-124909[U]
Int. Cl.³ A44B *17/00, 21/00*
U.S. Cl. 24—297 **4 Claims**

1. A part-fixing clip capable of providing detachable union of a substrate and a part which has rectangular holes or predetermined dimensions bored one each in advance therein, which clip comprises a male member and a female socket both

molded of plastics, said male member being provided with a shank, a flange disposed at the front end of said shank, an engaging head extended from the front end of said flange and adapted to be passed through the rectangular hole in said substrate and engaged with a pair of longer edges of the rectangular hole in said substrate in a straddling state, and an operating part disposed at the opposite rear end of said shank, said female socket being provided with a frame part accommodating said shank flange rotatably with some clearance therebetween and permitting said engaging head to be projected out of the font side thereof and having an opening, and a barrel projected from the bottom of said frame part to surround said opening and adapted to rotatably retain therein, said shank and



said operating part on a non-returnable fashion, the inside of said barrel part having a resilient shape permitting said operating part retained therein to produce rotary and translational motion in one direction while precluding axial movement relative to said barrel, the outside of said barrel part having a shape substantially conforming to the predetermined dimensions of said rectangular hole in said part, and the outer periphery of said barrel part being provided with engaging parts for engagement with said part, said engaging head of said male member being capable of being disengaged from said pair of longer edges of the rectangular hole in said substrate by rotating said male member relative to said female socket having said part engaged therewith by resilient distortion of said female socket without disengagement of said socket from said part.

4,506,420

WARP BEAM WINDING FRAME

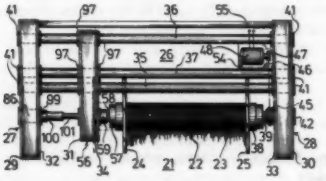
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,766

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149304

Int. Cl.³ D02H *5/00*

U.S. Cl. 28—190 **20 Claims**



1. Holding frame for a package beam of a heavy winding machine, comprising a right side frame and a left side frame, each of said side frames being formed of a pair of flat sheet steel plates, tension resistant and compression resistant spacer members being interposed between each pair of plates, each pair of plates being bolted together with said spacer members therebetween, first carriers formed of steel penetrating said pla es at connection locations and rigidly connecting said side frames to each other, a beam receiving device disposed at least at one of said side frames, a second carrier with a tubular shape penetrating said pair of plates of said at least one side frame at connection locations and supporting said beam receiving device, and detachable force transmission devices being disposed between said plates and at least one of said carriers at least at one of said connection locations.

4,506,421

CONTROLLED-DEFLECTION ROLL

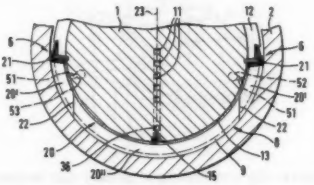
Valentin Appenzeller, Kempen, and Eduard Küsters, Gustav-Fünders-Weg 18, 4150 Krefeld-Forstwald, both of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,765

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128722

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **11 Claims**



1. In a controlled deflection roll comprising a rotating shell forming the working roll periphery and a stationary beam extending longitudinally through the shell and spaced on all sides from the inner periphery of the shell, and chambers defined by seals between the beam and the inner periphery of the shell on the beam, a number of chambers being disposed along the shell in the neighborhood of the operative plane of the roll, said chambers being fillable with a fluid pressure medium, the pressure in each individual chamber being separately adjustable, a fluid pressure medium supplied to a respective cavity pressing depending on the pressure in a corresponding adjacent chamber, the improvement comprising the seals comprising stationary longitudinal seals disposed on each side of the operative plane, said longitudinal seals extending through the whole length of the shell, transverse end seals, contacting said longitudinal seals, disposed at both ends of the roll, and further transverse seals spaced apart along the roll common to each pair of successive chambers, co-operating with said longitudinal seals to form the closed chambers, said transverse seals comprising annular webs, having a substantially rectangular cross-section and further including annular slots in the beam, said webs movably disposed in said slots, a cavity being formed at the base of each annular slot under the annular web and means for maintaining the annular webs tightly in a sealing manner against the stationary longitudinal seals even when they move in the annular groove in the operative plane of the roll relative to the stationary longitudinal seals.

4,506,422

METHOD OF PRODUCING BEARING DEVICES FOR WHEELS OF AUTOMOBILES

Tomoyoshi Egusa, Iwata, Japan, assignor to NTN Toyo Bearing Company, Limited, Osaka, Japan

PCT No. PCT/JP82/00018, § 371 Date Sep. 14, 1982, § 102(e) Date Sep. 14, 1982, PCT Pub. No. WO83/02418, PCT Pub. Date Jul. 21, 1983

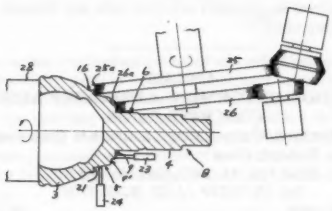
PCT Filed Jan. 19, 1982, Ser. No. 420,238

Int. Cl.³ B21H *1/12*

U.S. Cl. 29—148.4 R **2 Claims**

1. A method of manufacturing a bearing assembly for the

wheels of automobiles, which bearing assembly comprises an outer member having two raceway surfaces formed on its inner periphery, an axle member having formed on its outer periphery a raceway surface and a back-face rib surface for supporting large end faces of tapered rollers, an inner annular member having formed on its outer periphery another raceway surface and a backface rib surface for supporting large end faces of tapered rollers, and two rows of tapered rollers interposed between the raceway surfaces of said outer member, said axle member and said inner annular member, said axle member being formed with a cylindrical seat on which the inner annular member is fitted with said inner annular member in contact with a shoulder formed at one end of the cylindrical seat, said method being characterized by the steps of grinding the raceway surface and the cylindrical seat of said axle member simultaneously by a grinding wheel; feeding any deviation of the finished raceway diameter of said axle member from its predetermined size back to an in-process control gauge which controls the grinding operation for the back-face rib surface and the shoulder; thereby grinding the back-face rib surface and the shoulder simultaneously by a grinding wheel; while grinding the raceway surface of the inner annular member; feeding any deviation of the finished raceway diameter of said inner annular member from its predetermined size back to an in-process control guage which controls the grinding operation for the back-face rib surface and a front face on which the inner annular member abuts against the shoulder; thereby grinding the back-face rib surfce and the front face simultaneously by a grinding wheel; and fitting the inner annular member on the cylindrical seat of the axial member until it abuts against the shoulder.



4,506,423

METHOD OF PRODUCING A FLUID PRESSURE REDUCING DEVICE

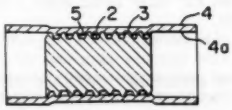
Keiichi Nakamura, Ebina; Hiroshi Asao, Fujisawa; Kenichi Okada, Yokohama; Yoichi Wakabayashi, Sano, and Izumi Ochiai, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 333,415, Dec. 22, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 512,948

Claims priority, application Japan, Dec. 24, 1980, 55-182084; Dec. 24, 1980, 55-182085; Jun. 26, 1981, 56-93724

Int. Cl.[3] **B21D** *53/00;* **B21K** *29/00;* **B23P** *15/26*

U.S. Cl. 29—157 R **15 Claims**



1. A method of producing a fluid pressure reducing device, the method comprising the steps of:

inserting a solid core provided with a peripheral spiral groove extending from one end thereof to the other into a relatively thin metal pipe having an inner diameter larger than an outer diameter of said core and made of a material softer than material of said core; and

applying a radially compressive force to the portion of said pipe receiving said core to thereby contract said portion of said pipe into said spiral groove so that the inner diameter thereof is smaller than the outer diameter of said core but larger than a diameter of a root of said spiral groove to allow a predetermined amount of fluid to flow through said groove.

4,506,424

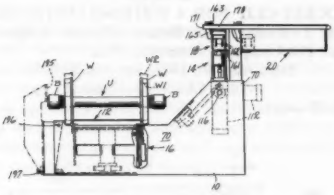
AUTOMATED RAILROAD BEARING HANDLING MACHINE

Otmar Ulbing, Fairport, N.Y., assignor to USM Corporation, Farmington, Conn.

Filed Sep. 29, 1982, Ser. No. 426,835

Int. Cl.[3] **B23P** *19/04*

U.S. Cl. 29—252 **2 Claims**



1. In a machine for operating on bearings at opposite ends of wheel sets comprising an axle having a pair of railroad wheels press fitted thereon, the improvement comprising means for locating the axis of each wheel set in a particular plane; a gage having a probe movable along said plane into engagement with the periphery of at least one of the wheels for locating the axis of the wheel set, the gage including a gage plate having a secondary probe swingable about the point of engagement of the first named probe into engagement with the wheel periphery at a spaced location, a gaging surface assuming an angular disposition depending on the extent of swinging movement of the gage plate indicative of the location of the wheel set axis; a unit having a centerline for operating on the bearings of the wheel set; and an assembly for moving the wheel set along said plane a predetermined distance depending on the gaged location of said axis for aligning the wheel set axis with the centerline of operation of said unit.

4,506,425

METHOD FOR THE HOT REPAIR OF THE PROTECTIVE LAYER PROVIDED ON THE PERMANENT LINING OF A TUNDISH OF A CONTINUOUS CASTING PLANT

Otto Hoyer, Linz; Norbert Antensteiner, Leonding, and Walter Fortner, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 14, 1981, Ser. No. 283,203

Claims priority, application Austria, Jul. 16, 1980, 3685/80

Int. Cl.[3] **B23P** *7/00;* **B22D** *11/126;* **B29C** *17/02*

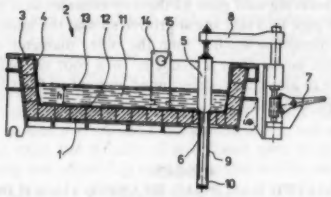
U.S. Cl. 29—402.18 **7 Claims**

1. A method for the hot repair of a sprayed on protective layer provided on the permanent lining of a tundish of a continuous casting plant, which method comprises the steps of

retaining a residual amount of steel having a layer of slag thereon in said tundish, said slag-covered steel covering the bottom of said tundish,

cooling said residual-steel and slag layer until it solidifies into a plate adhering to said protective layer,

removing said plate from said tundish in a still hot state along with said adhering protective layer, and



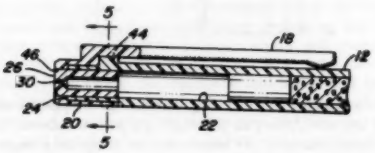
spraying a hot-repair mass onto the permanent lining of the still hot tundish so as to form a new protective layer.

4,506,426

POCKET CLIP FOR A WRITING INSTRUMENT

Brian A. J. Booker, East Sussex, England, assignor to The Parker Pen Company, Janesville, Wis.

Filed Aug. 30, 1983, Ser. No. 527,772
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—413 **7 Claims**



1. A method of affixing a pocket clip and to a writing instrument of the type having a tubular barrel open at the rear end, comprising the steps of

molding an integral member having a pocket clip a tubular section which is open at its front end and closed at its rear end by an annular wall and a rearwardly extending plug, said tubular section being dimensioned to be press-fittable over the rear end of said barrel, and said plug being dimensioned to be press-fittable into the open rear end of said barrel,

pressing said tubular section of said member onto the rear end of said barrel until said annular wall abuts the rear end of said barrel, and then

applying a longitudinally directed force to said rod to fracture said wall to separate said rod from said wall and to push said rod into the open rear end of said barrel.

4,506,427

METHOD FOR THREADING CHAIN ONTO A LAMP CORD

Richard A. Castillo, Newbury Park, Calif., assignor to Modulite Corporation, Los Angeles, Calif.

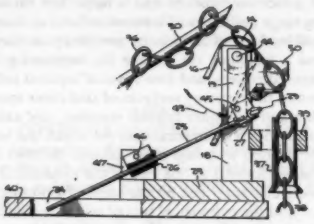
Filed Nov. 29, 1982, Ser. No. 445,021
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—433 **5 Claims**

1. A method of threading a lamp cord into selected links of a chain that consists of a series of interconnected links, comprising the steps of:

capturing the selected links of the chain sequentially onto the exterior of a hollow lamp cord chute;

inserting the lamp cord into the hollow interior of said hollow lamp cord chute; and

simultaneously withdrawing said lamp cord from the hollow interior of said hollow lamp cord chute and said selected links of said chain from the exterior of said hollow lamp



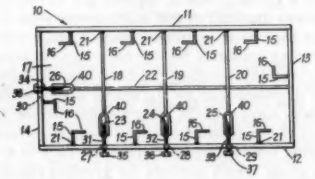
cord chute so that said selected links are threaded onto said lamp cord.

4,506,428

METHOD OF FORMING A PREFABRICATED CONCRETE PANEL

Robert E. Gerhard, Wolcott, Conn., assignor to Bank Constructors, Inc., Wolcott, Conn.

Filed Feb. 14, 1983, Ser. No. 465,816
Int. Cl.³ B23P *11/02;* **B28B** *9/04*
U.S. Cl. 29—446 **14 Claims**



1. A method of forming a panel, comprising:

forming an outer generally rectangular metallic skeletal panel frame;

affixing a plurality of discrete adjustable clamping means between opposite side members of the panel frame;

pouring a lightweight concrete slurry within the panel frame; and

adjusting the clamping means to apply constraining force to the opposite side members of the panel frame subsequent to pouring but prior to hardening of the concrete slurry.

4,506,429

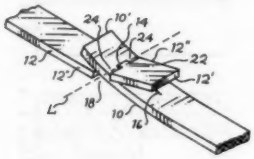
METHOD FOR PREPARING BELT END PORTIONS FOR SPLICED MECHANICAL INTERCONNECTION, BELT END PORTIONS PREPARED THEREBY AND SPLICED INTERCONNECTION FORMED THEREWITH

Alan Gutschmit, Troy, N.C., assignor to Alandale Knitting Company, Inc., Troy, N.C.

Filed Nov. 12, 1982, Ser. No. 441,116
Int. Cl.³ B23P *11/02;* **F16G** *3/00*
U.S. Cl. 29—450 **5 Claims**

1. A method of preparing two belt end portions for mechanical interconnection thereof comprising the steps of cutting each said belt end portion substantially perpendicularly to the longitudinal extent thereof to provide substantially squared belt ends, providing press means for punching openings of a substantially square shape in said belt end portions of an edgewise dimension at least approximately one-third of the transverse dimension of said belt end portions, operating said press means to form an opening in one belt end portion centrally of the transverse dimension thereof with one straight edge of said central opening oriented transversely to the longitudinal extent

of said one belt end portion in substantially parallel relation to its said squared belt end, forming a slit in said one belt end portion extending longitudinally from said central opening away from the belt end, and operating said press means to form transversely opposed openings in opposite transverse side edges of the other belt end portion spaced a transverse dimension approximately the same as said central opening with one straight edge of each said opposed opening oriented transversely to the longitudinal extent of said other belt end portion in substantially parallel relation to its said squared belt end, whereby said belt end portions may be mechanically interconnected by inserting said other belt end portion through said central opening and said slit of said one belt end portion and positioning the transverse extent of said other belt end portion between its side edge openings transversely within said central opening.

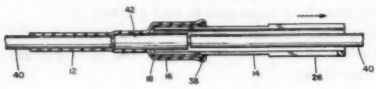


4,506,430

ELASTIC COVER APPLICATOR AND METHOD OF APPLYING COVER

Casimir M. Guzay, Jr., Hoffman Estates, Ill., assignor to Panduit Corp., Tinley Park, Ill.

Filed Sep. 19, 1983, Ser. No. 534,001
Int. Cl.³ B23P *11/02, 19/02*
U.S. Cl. 29—450 **23 Claims**



21. A method for applying a cover to an elongate object comprising the steps of:

positioning a folded elastic sleeve in a radially stretched condition upon a support having a longitudinal passage to interiorly accept the elongate object to be covered, the elastic sleeve having an inner sleeve portion and a coaxially disposed outer sleeve portion, the sleeve portions being continuously joined at an annular edge;

applying a separating and lubricating means between the inner sleeve portion and outer sleeve portion;

coaxially positioning the supporting means around the elongate object; and

applying a longitudinal force to the outer sleeve portion effecting longitudinal movement in the outer sleeve portion relative to the inner sleeve portion whereby the outer sleeve portion is moved beyond the supporting means and progressively is applied to the elongate object to be covered.

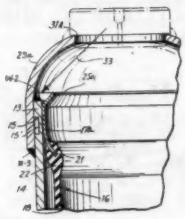
4,506,431

METHOD OF MAKING PRESSURE RESISTANT ACCUMULATOR DEVICE

Jacques H. Mercier, Stamford, Conn., assignor to The Normand Trust, New York, N.Y.

Division of Ser. No. 401,863, Jul. 26, 1982, Pat. No. 4,429,718. This application Oct. 11, 1983, Ser. No. 540,361
Int. Cl.³ B21D *51/24;* B23K *31/02*
U.S. Cl. 29—454 **4 Claims**

1. The method of fabricating a pressure resistant accumulator device which includes a pressure vessel having a closed end including an oil port, and an open end having an upwardly directed edge, a bladder assembly including a metallic mounting skirt, and a cap member having an opening for the reception of a gas charging assembly, said cap member including a depending skirt terminating in a downwardly directed edge, which comprises the steps of inserting said mounting skirt into said vessel, forming a first continuous annular weld connection between said mounting skirt and said vessel, causing said skirt of said cap member to be mounted over said open end of said vessel, forming a second continuous annular connection between said upwardly directed edge portion and inner wall portion of said cap member, and forming a third continuous annular weld connection between said edge portion of said cap and outer wall portion of said vessel.

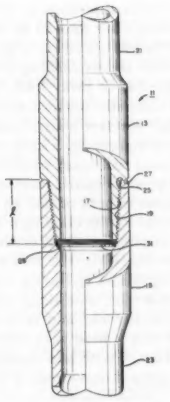


4,506,432

METHOD OF CONNECTING JOINTS OF DRILL PIPE

Jackie E. Smith, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 3, 1983, Ser. No. 538,648
Int. Cl.³ B23P *25/00*
U.S. Cl. 29—458 **3 Claims**



1. A method of connecting joints of drill pipe for rotary earth drilling in a geothermal well, the joint having tool joint members on each end with threaded connections for connecting the joint with other joints of drill pipe, comprising the steps of:

applying nickel plating to a portion of the threaded connection of at least one of said tool joint members;

applying a zinc base thread compound to the threaded connection; and

making up a joint of drill pipe by threadedly connecting the nickel plate threaded connection of one tool joint member

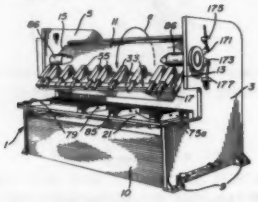
with the threaded connection of a mating tool joint member.

4,506,433

MACHINE FOR BENDING AND SHEARING SHEET METAL

Roger Gingras, 1245 Marie-Victorin, Saint-Nicolas, Québec, Canada (G0S 2Z0)

Filed Jun. 10, 1983, Ser. No. 502,950
Int. Cl.³ B21D *5/01;* **B23P** *23/00*
U.S. Cl. 29—560 **27 Claims**



1. A machine for bending and shearing sheet metal comprising a framework, said framework including two upright members defining the lateral ends of said framework, a rocker head having a first horizontal edge and a second horizontal edge, a pivoting device for mounting said rocker head between the two upright members on the upper part of said framework so as to enable said rocker head to pivot between the two upright members, the first edge of said rocker head comprising means for cutting said sheet metal and the second edge comprising a wedge for bending said sheet metal, control means associated with said pivoting device to enable the rocker head to adopt a first vertical position in which the first edge and its cutting means are located at the lower end of said rocker head, said control means also enabling the rocker head to pivot 180° so as to adopt a second vertical position in which, the second edge and its bending wedge are located at the lower end of said rocker head, said framework comprising a table on which the sheet metal can move, means enabling the table to more vertically be drawn towards or away from the lower end of said rocker head, said table also comprising a longitudinal cutting primary matrix, said primary matrix being placed at an inner end of said table and comprising a knife forming its inner edge, a longitudinal bending secondary matrix shaped to rest on the upper face of said primary matrix, said secondary matrix comprising shaping means in back of said knife enabling the bending of the sheet metal by the combined action of the bending wedge and of the shaping means, an eccentric associated to the pivoting device so that when the rocker head is in said first position, the cutting means, following a drawing of the table towards the cutting means, slide along the internal face of said knife to shear the sheet metal and after said rocker head has pivoted 180°, said rocker head is in said second position, the bending wedge is aligned with said shaping means to bend said sheet metal upon upward movement of said table.

4,506,434

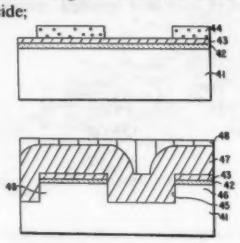
METHOD FOR PRODUCTION OF SEMICONDUCTOR DEVICES

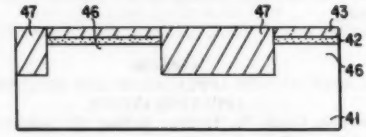
Tetsuya Ogawa, Machida, and Nobuo Toyokura, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 3, 1982, Ser. No. 414,803
Claims priority, application Japan, Sep. 10, 1981, 56-142911
Int. Cl.³ H01L *21/76, 21/302, 21/20*
U.S. Cl. 29—571 **9 Claims**

1. A method for producing a semiconductor device having a substrate, element fabrication areas formed in said substrate and dielectric isolation areas surrounding said element fabrication areas, said method comprising:

(a) forming a thermal strain absorbing layer on the top surface of said element fabrication areas, wherein the material of said thermal strain absorbing layer is a material selected from the group consisting of polycrystalline silicon, molybdenum silicide, tungsten silicide, titanium silicide and tantalum silicide;





(b) forming at least one groove in an area which is to become said isolation areas;

(c) forming by deposition a dielectric insulator on said thermal strain absorbing layer and in said groove; and

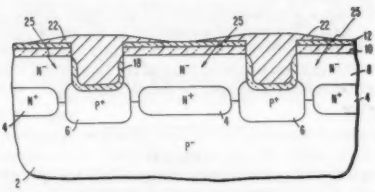
(d) annealing said insulator to make the density thereof uniform while said thermal strain absorbing layer remains on said top surface.

4,506,435

METHOD FOR FORMING RECESSED ISOLATED REGIONS

William A. Pliskin; Jacob Riseman, both of Poughkeepsie, and Joseph F. Shepard, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,468
Int. Cl.³ H01L *21/76, 21/95*
U.S. Cl. 29—576 W **28 Claims**



1. A method for forming recessed dielectric isolation in a silicon substrate comprising:

forming by reactive ion etching a pattern of trenches in the order of microns in depth and with substantially vertical walls in the areas of one surface of said substrate wherein said isolation is desired;

oxidizing the surfaces of said trenches to form a silicon dioxide layer thereon;

depositing a glass having a thermal coefficient of expansion that approximates that of silicon and is between about 20 to 50×10^{-7} per degree centigrade and has a softening temperature of less than about 1200° C. onto the said surface of said substrate; and

thermally heating the structure to cause the flow of said glass on said surface and filling of said trenches.

4,506,436

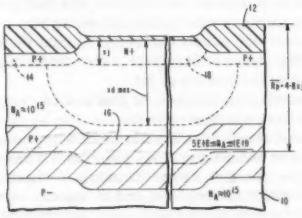
METHOD FOR INCREASING THE RADIATION RESISTANCE OF CHARGE STORAGE SEMICONDUCTOR DEVICES

Paul E. Bakeman, Jr., Shelburne, and Robert M. Quinn, South Burlington, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,230

Int. Cl.³ H01L *27/02*

U.S. Cl. 29—577 C **11 Claims**



1. The method of manufacturing integrated circuit devices having a reduced susceptibility to radiation induced loss of charged data states in which a semiconductor substrate having a substantially uniform predetermined impurity concentration of a first conductivity type and having a predetermined thickness is sequentially exposed to a plurality of semiconductor processing steps which include at least two high temperature processing steps requiring processing temperatures in excess of about 500° C., one of which is used to form surface device p-n junction regions having a predetermined maximum depletion depth in a normal operating environment, characterized by the step of

providing in a portion of the substrate a buried layer of increased first impurity concentration before the last of the high temperature processing steps so as to provide at the completion of all of the processing steps a buried non-degenerate impurity concentration profile having a maximum concentration of between 5×10^{16} and 1×10^{19} impurity atoms per cubic centimeter and being one to four orders of magnitude greater than the predetermined impurity concentration of the substrate and the buried layer being at a depth throughout its extent so as to be deeper than the regions of substantial electrical activity of devices formed on the surface of the substrate, whereby portions of the substrate above and below said buried layer remain at said predetermined impurity concentration.

4,506,437

PROCESS FOR AND STRUCTURE OF HIGH DENSITY VLSI CIRCUITS, HAVING SELF-ALIGNED GATES AND CONTACTS FOR FET DEVICES AND CONDUCTING LINES

Gordon C. Godejahn, Jr., Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

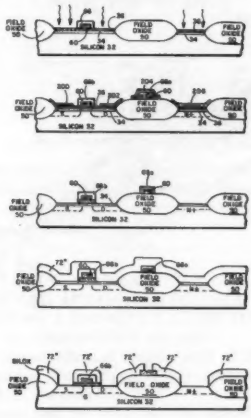
Division of Ser. No. 909,886, May 26, 1978, Pat. No. 4,277,881.

This application Jul. 12, 1982, Ser. No. 397,052

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ H01L *21/225, 21/441*

U.S. Cl. 29—577 C **10 Claims**



1. A process for fabricating a field effect semiconductor device on a monocrystalline silicon substrate having a first surface on which said device is to be formed, comprising the steps of:

thermally oxidizing the surface of said semiconductor substrate to form a silicon dioxide layer thereon,

forming a silicon nitride layer on said silicon dioxide layer,

retaining portions of said silicon nitride layer and the corresponding underlying silicon dioxide layer in said selected area and removing remaining portions of said silicon nitride and silicon dioxide layers to expose said substrate surface outside said selected area,

thermally growing a field oxide on said exposed surfaces of said substrate surrounding said selected area,

depositing a layer of doped polysilicon on said nitride layer,

delineating said polysilicon layer to define a gate polysilicon layer extending transversely of said selected area for each said active device and to define polysilicon conducting lines on said field oxide, and removing remaining portions of the polysilicon layer, said gate polysilicon layer defining first and second, remaining portions of said selected area corresponding to source and drain regions to be formed for said device,

oxidizing the surfaces of said gate polysilicon layer and of said polysilicon conducting lines while retaining the silicon nitride layer over said source and drain regions of said device to prevent the formation of any substantial amount of thermal oxide on said source and drain regions,

removing exposed portions of the silicon nitride layer by a material selective, batch etch removal process, thereby to expose the underlying silicon dioxide layer on said source and drain regions,

removing the silicon dioxide layer uncovered by removal of the portions of the nitride layer, thereby to expose the surface of said substrate at said source and drain regions to be formed, for said device thereby to provide self-aligned

vias for electrical contacts to said source and drain regions to be formed, for said device, and

doping said first and second portions to form said source and drain regions for said device.

4,506,438

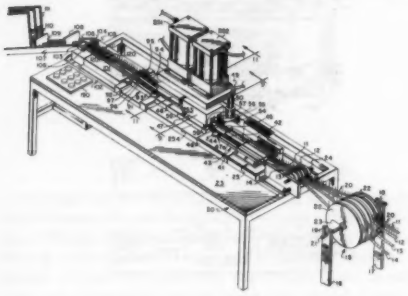
APPARATUS FOR MANUFACTURING INTEGRATED CIRCUIT CONNECTORS

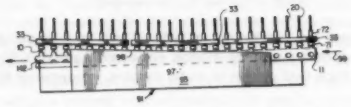
J. Preston Ammon; Harry R. Weaver, and Evan J. Evans, all of Dallas, Tex., assignors to Elfab Corporation, Lewisville, Tex.

Division of Ser. No. 316,998, Nov. 2, 1981, Pat. No. 4,417,396. This application Jul. 12, 1983, Ser. No. 504,335

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—739 **6 Claims**





1. Apparatus for assembling socket contacts mounted to a plurality of carrier strips with integrated circuit connector insulators provided in predefined arrays, each of said contacts comprising an enlarged upper socket portion received within apertures in the insulator for receiving integrated circuit leads therein and a lower tail portion for depending from said insulator for electrical connection, said apparatus comprising:

a generally horizontal surface having a plurality of generally parallel channels formed longitudinally thereacross for receiving contact carrier strips having contact sockets affixed thereto and contact tails extending transversely thereof;

means for advancing said contact carrier strips upon said horizontal surface in synchronized, intermittent movement of predefined longitudinal distances;

means for aligning the tails of the contacts extending from the carrier strips upon said surface into preselected alignment for being received into apertures formed in linear rows in the insulators and positioned in linear alignment within the insulator array;

means for press-fitting the contact socket portions into the apertures of the insulator of the array;

means for separating individual ones of said insulators of the array one from the other upon said horizontal surface to provide individual integrated circuit connector assemblies; and

means for separating said connector assemblies from said carrier strip including means for advancing said assembled contacts and insulators transversely relative to the carrier strips for removing the contacts therefrom.

4,506,439

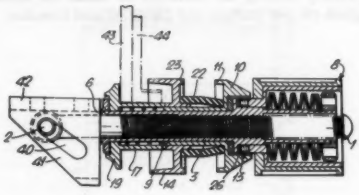
APPARATUS FOR SECURING AN ELECTRONIC UNIT TO AN AVIONICS TRAY

Joseph C. Roake, Lyme, near Chertsey, England, assignor to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Sep. 1, 1983, Ser. No. 528,903

Int. Cl.³ H05K *13/04*

U.S. Cl. 29—747 **9 Claims**



1. Apparatus for removing and securing a plug-in electronic unit from or to an avionics tray, which apparatus comprises

(i) a threaded spindle one end of which includes a transverse pin for pivotally mounting the spindle in a retaining member attached to or forming part of the avionics tray such that the spindle can move about the transverse axis of said pin but cannot rotate about its own axis;

(ii) a first sleeve having a first portion relatively remote from the transverse pin and having a second, internally threaded portion which is threaded onto the spindle, the internal diameter of the first portion being slightly greater than the external diameter of the spindle;

(iii) a first stop member formed in or attached to the end of the first sleeve nearest to the transverse pin;

(iv) a second stop member arranged to limit the movement of the first sleeve with respect to the spindle in a direction away from the transverse pin;

(v) a rotatable grip fitted about that end of the first sleeve remote from the transverse pin;

(vi) a second sleeve coaxial with, and positioned around the first sleeve and having at its end remote from the transverse pin a radial flange including a shoulder facing towards the transverse pin, and an annular recess which cooperates with the rotatable grip and the first sleeve to define an annular cavity around the first sleeve;

(vii) a torque limiting arrangement positioned in said annular cavity and serving to interconnect the rotating grip and the first sleeve such that rotation of the grip in the direction towards the transverse pin causes the first sleeve to move along the threaded portion of the spindle towards the transverse pin so long as the torque between grip and said first sleeve is less than a predetermined value;

(viii) a ring member including (a) a sleeve portion coaxial with and positioned for sliding movement on the outer surface of the second sleeve, (b) an internal surface open towards the transverse pin, and (c) a shoulder facing inwards, and capable of abutting, the shoulder of the second sleeve;

(ix) a third sleeve coaxial with and positioned for relative sliding movement over that part of the outer surface of the second sleeve nearest to the transverse pin, the third sleeve being retained at its end nearest to the transverse pin by the first stop member and having, at that end, (a) a radially inwardly facing abutment which holds the third sleeve away from the first sleeve and which defines in cooperation with the inner surface of the third sleeve the outer surface of the first sleeve and the end of the second sleeve, a sheath like cavity around the first sleeve, and (b) a radially outwardly extending flange, the other end of said third sleeve being in contact with the radially inward part of the taper ring;

(x) a resilient element located in said sheath-like cavity and arranged so as to tend to urge the second and third sleeves

away from one another in the axial direction of the spindle;

(xi) a generally cylindrical, elastomeric spacer element held between the radial flange of the second sleeve and that end of the ring member remote from the transverse pin, the arrangement being such that when the ring member and said radial flange move towards each other, their respective shoulders come into abutment so as to retain the compressed elastomeric spacer element within a cavity defined between the ring member and said radial flange; and

(xii) means for urging the rotating grip towards the torque limiting arrangement.

4,506,440

WIRING TOOL FOR WIRING ELECTRIC MULTI-PIN PLUG-IN CONNECTORS, CONNECTOR STRIPS OR THE LIKE USING CLAMP-CUTTING TECHNIQUES

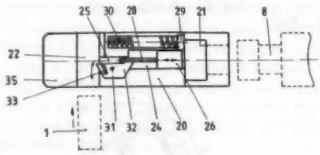
Reiner Rommel, Moldaustrasse 6, D-3570 Stadt Allendorf, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,501

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137209

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—751 **6 Claims**



1. A wiring tool for wiring an electric connector of the type having a series of cells bounded by cell walls within each of which a wire clamp is mounted, and with the tool comprising, in combination, a head removeably mountable to a handle, a guide slot formed in said head for slideably receiving an electric connector, plunger means mounted for reciprocal movement through said head toward and away from said guide slot along a path of travel for pressing an insulated wire of an array of wires into a cell clamp of an electric connector located in said guide slot; means for reciprocally driving said plunger along said path of travel; and feed lever means pivotably mounted to said head about an axis located beside said path of travel and beside said guide slot and responsive to movement of said plunger means to move into engagement with a cell wall of a cell that is to receive an insulated wire for stepping the connector along said guide slot so as to position another cell clamp along said path of plunger travel.

4,506,441

WORKPIECE ATTACHING AND DETACHING APPARATUS

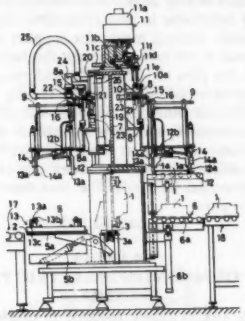
Junichi Yamanaga, Fujimi, and Shiro Naito, Hidaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,954

Int. Cl.³ B23P *21/00*

U.S. Cl. 29—787 **8 Claims**

1. A workpiece attaching and detaching apparatus for attaching a workpiece to a pallet by fastening a fastening means provided on the pallet or detaching the workpiece from the pallet by unfastening the fastening means, characterized in that the apparatus comprises a supporting column having on one side of the periphery thereof a first station for a pallet to be charged or discharged and on another side thereof a second station for a workpiece to be charged or discharged, an annular rail means attached to the supporting column so as to surround the same, plural heads supported on the annular rail means, and an index means for selecting any desired one of the heads and moving the selected one between its first working position located opposite to the first station and its second working



position located opposite to the second station, each of the heads being provided with both a holding means for holding the workpiece and a fastening-and-unfastening means for the foregoing fastening means.

4,506,442

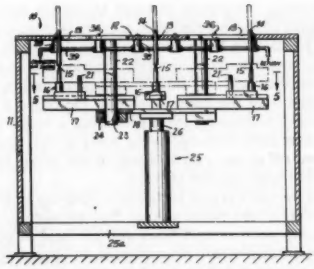
METHOD AND APPARATUS FOR STACKING A PLURALITY OF LAMINATE LAYERS TO FORM A COMPOSITE BOARD

Donald R. Alzmann; Michael Angelo, both of East Islip, and Paul R. Waldner, Wantagh, all of N.Y., assignors to Lenkeit Industries, Inc., Farmingdale, N.Y.

Filed Sep. 29, 1982, Ser. No. 428,042

Int. Cl.³ H05K *3/36*; B65G *57/02*

U.S. Cl. 29—830 **22 Claims**



1. A method of stacking a plurality of laminate layers in registered, superposed relation to enable the layers to be joined to form a composite board, said method comprising successively stacking a plurality of laminate layers in aligned superposed relation on pins projecting through a support surface of a table, the laminate layers being provided with alignment holes through which the pins extend when the layers are stacked thereon, raising said pins relative to said table after successive laminate layers have been placed on the pins to provide a predetermined projection of the pins from the last successive laminate layers placed on the stack and removing the stack of laminate layers with said pins therein from the table.

10. Apparatus for stacking a plurality of laminate layers in registered, superposed relation to enable the layers to be joined to form a composite board, said apparatus comprising a table having a surface on which a plurality of laminate layers can be

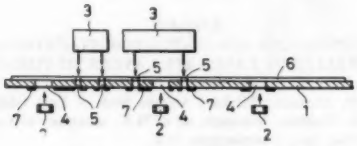
successively stacked in aligned superposed relation, the laminate layers being respectively provided with alignment holes therein adapted for being aligned in successively stacked layers, said table having aperture means for alignment with the holes in the laminate layers, a pin slidably mounted in each aperture means in said table for extension therefrom, said pin being freely insertable in and removable from its respective aperture means, support means for support of the pins in the aperture means in the table to permit the laminate layers to be mounted on the pins in succession, said pins being insertable into said aperture means for freely resting on said support means so that the pins can be freely lifted off the support means, and means operatively associated with the support means for raising the support means relative to said table after successive laminate layers have been placed on the pins to provide a given projection of the pins from laminate layers placed on the pins.

4,506,443

METHOD OF MOUNTING ELECTRIC PART ONTO A SUBSTRATE

Tsukasa Itoh, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,006
Int. Cl.³ H05K *3/34*
U.S. Cl. 29—840 **3 Claims**



1. A method for mounting electric parts on a printed circuit board which comprises the steps of:

providing a printed circuit board having a conductive circuit pattern on one side thereof, part body-receiving holes extending completely through the board and which are adapted to receive electrical parts to be placed in the parts body-receiving holes from said one side of the board, the parts so mounted to provide exposed electrodes on and adjacent to said one side of the board, said board having applied over the opposite side of the board a permanent adhesive-containing sheet providing a tacky surface facing said parts body-receiving holes so that said holes are closed off at said opposite side of the board and are only open at said one side thereof;

placing the parts in said parts body-receiving holes from said one side of the board so that they are surrounded by the defining walls of said holes and are held in place by the tacky surface of said permanent sheet on said opposite side of the board and so that said electrodes are exposed to and are adjacent to said one side of the board; and

soldering together on said one side of the board said conductive circuit pattern, and said exposed electrodes of the parts placed in said parts body-receiving holes.

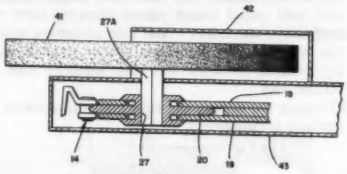
4,506,444

CHAIN SAW BAR

Erik W. Sundström, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Mar. 23, 1983, Ser. No. 478,032
Claims priority, application Sweden, Apr. 6, 1982, 8202208
Int. Cl.³ B27B *17/02*
U.S. Cl. 30—122 **7 Claims**

1. Saw bar in a motor-driven chain saw, said saw bar having at its free end a sprocket supporting a saw chain and being rotatably mounted between two side plates in the saw bar on a tubular shaft such that said saw chain transmits rotary motion from a motor to said sprocket, said shaft being rigidly connected to the sprocket and is adapted to transfer rotation to a driven shaft inserted into a through-hole in the tubular shaft for driving an auxiliary tool, bearing means being arranged in both



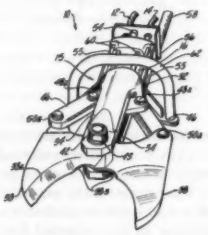
side plates rotatably supporting said tubular shaft, said tubular shaft having opposite ends disposed substantially flush with said side plates so that said shaft is short enough to be inserted into a kerf sawed by the saw chain.

4,506,445

RESCUE CUTTER TOOL

Harold Esten, Glenside, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Feb. 22, 1983, Ser. No. 468,183
Int. Cl.³ B26B *15/00*
U.S. Cl. 30—228 **7 Claims**



1. A hydraulically powered, hand-manipulatable rescue cutter tool comprising:

a body having a longitudinal axis, said body including a fluid cylinder and a forward end structure;

a pair of cutting blades pivotally connected on the forward end structure about an axis which is normal to the longitudinal axis of the body, said cutting blades each including opposite sides and cutting edges, and being movable between non-cutting open and closed cutting positions; a side of each cutting blade coming into contact with the other when the cutting blades are in their closed cutting position;

fluid powered means pivoting said cutting blades between opened and closed positions, said fluid powered means including a piston slidable in said cylinder, a piston rod projecting outwardly through an opening in the forward end structure, and

linking means including a pair of links, each of said links pivotally interconnecting a forward end of the piston rod with one of the cutting blades, each of said links being asymmetrically connected to one of the cutting blades only on the side opposite the side of each cutting blade which comes in contact with the other when the cutting blades are in their closed positions;

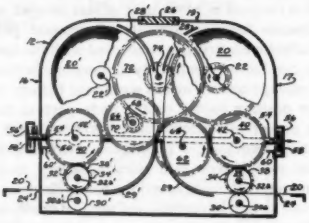
a pair of handles secured to the tool for supporting and manipulating the tool;

and control means adjacent at least one of the handles for controlling the fluid power means to open and close the cutting blades.

4,506,446
TAPE MEASURE HAVING TWO TAPES

Rodger Mitchell, 921 Pontiac, Wilmette, Ill.

Filed Feb. 22, 1983, Ser. No. 468,327
Int. Cl.[3] G01B 3/10
U.S. Cl. 33—139 7 Claims



1. A tape measuring device comprising

a housing for enclosing a plurality of tape measuring means having formed thereon a system of indicia adapted to measure a linear distance,

a plurality of tape measuring means carried within said housing and adapted to extend therefrom to measure a linear distance,

gear means mutually exclusively operatively connected to each of said plurality of said tape measuring means for transferring linear displacement of said tape measuring means into a corresponding rotational motion,

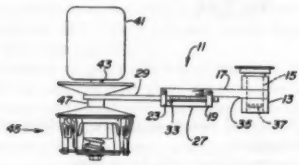
gear shifting means extending through said housing and operatively connected to said gear means for mutually exclusively engaging said gear means with said plurality of tape measuring means, and

counting means carried within said housing and operatively connected to said gear means to sequentially register the sum of the linear distances to which each of said tape measuring means have been extended from the housing.

4,506,447
CENTER DISTANCE MEASURING TOOL

James P. Lob, Oconomowoc, Wis., assignor to Deere & Company, Moline, Ill.

Filed Sep. 22, 1983, Ser. No. 534,997
Int. Cl.[3] G01B 5/14
U.S. Cl. 33—181 R 3 Claims



1. A service tool for measuring the center distance between two generally parallel extending shafts comprising:

a mounting block defining a first elongated open ended cylindrical chamber;

an indicator bar fixably mounted to said mounting block perpendicular to said cylindrical chamber;

a gauge bar having a generally L-shape;

a first clamp;

a second clamp;

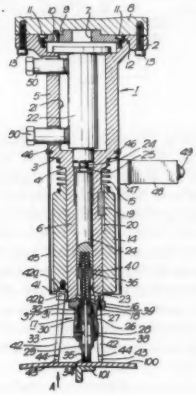
said first and second clamps fixably mounted to said indicator bar in spaced apart relationship and slidably maintaining said gauge bar parallel and longitudinally abutting to said indicator bar such that said gauge bar has a portion perpendicular to both said cylindrical chamber and said indicator bar; and,

a retaining pin fixably mounted in said gauge bar between said clamps and having a portion of said retaining pin external to said gauge bar such that said external portion of said retaining pin is in abutting alignment to at least one of said clamps.

4,506,448
TEACHING ROBOTS

Joseph R. Topping, and John D. Jones, both of Preston, England, assignors to British Aerospace Public Limited Company, London, England

Filed Oct. 26, 1982, Ser. No. 436,824
Claims priority, application United Kingdom, Oct. 27, 1981, 8132307
Int. Cl.[3] G01B 3/22
U.S. Cl. 33—185 R 7 Claims



1. A device for enabling a robot arm to be accurately positioned relative to a workpiece or template when programming the robot, the device comprising:

a hollow body member having a mounting portion adapted for fixing to the robot arm,

a movable member supported by the body member and movable with respect to the body member towards and away from said mounting portion,

abutment means fixed to the body member and operable to be engaged by the movable member to limit the extent of said movement of the movable member in the direction away from said mounting portion,

spring means engaged between the body member and the movable member and operable to urge the movable member into engagement with the abutment means,

a distance-setting member supported by said body member and extending therefrom in said direction away from said mounting portion, the distance-setting member having a hole extending through it in said direction,

a plurality of angle-setting finger members fixed to said movable member at respective positions spaced around the distance-setting member and extending from the movable member generally in said direction,

a probe pin mounted in said hole in the distance-setting member and movable with respect to the distance-setting member towards and away from said mounting portion of the body member between an extended position in which one end of the probe pin protrudes from the distance-setting member and a retracted position in which said one end of the probe pin lies within the distance setting member, and

drive means mounted within the body member and coupled

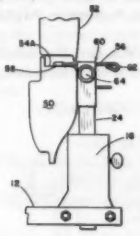
to the probe pin for moving the probe pin between said extended and retracted positions.

4,506,449

ROCKER CLIP ASSEMBLY

Roger Aldrich, Grand Island, Nebr., assignor to Chief Industries, Inc., Grand Island, Nebr.

Filed Aug. 23, 1982, Ser. No. 410,148
Int. Cl.³ G01B *5/25, 11/27*
U.S. Cl. 33—288 **1 Claim**



1. In apparatus for measuring alignment of vehicle chassis rocker arm panels, especially where said panels are located beneath doors of said vehicle, an alignment gauge of the type having at least one horizontal cross-bar and visible alignment measuring indicia means, said alignment gauge supportable, on vertical columns, transversely below the travel direction axis of said vehicle, means to support said vehicle columns upon said rocker arms beneath said door comprising:

a fixture attached to the top of each of said vertical columns;

a support arm adjustably affixed to the top of each said fixture, one end of said support arm extendable therefrom to rest on said rocker arm panels, said fixture further comprising:

a flat bar means of dimensions similar to those of said column;

plate means having groove means for holding said support arm in a selected angle;

means to hold said plate means tightly to said flat bar means, thereby clamping said support arm therebetween; and

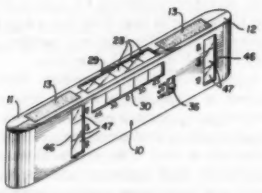
means to attach said flat bar means to the top of said vertical column.

4,506,450

ILLUMINATED LEVEL

John E. Fleming, 2505 N. 52nd Ave., Yakima, Wash. 98908, and Robert D. Dameron, 1317 S. 10th Ave., Yakima, Wash. 98902

Filed Mar. 27, 1984, Ser. No. 593,960
Int. Cl.³ G01C *9/06*
U.S. Cl. 33—366 **3 Claims**



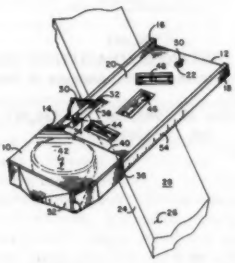
1. An illuminated level for use in horizontal and vertical modes selectively comprising a body portion, the body portion having first and second chamber means and a battery compartment, the body portion also having first and second display windows, a horizontal mode angle deviation indicator assembly mounted within the first chamber means, a vertical mode angle deviation indicator assembly mounted within the second chamber means, each assembly including an arcuate conductor channel containing a single droplet of a conducting liquid movable therein and a plurality of angularly spaced light emitting elements having terminals of like polarity projecting into said channel in the path of movement of said droplet, said light emitting elements having terminals of opposite polarity, a common conductor electrically connected with the last-named terminals, a conductor electrically connected between said channel and storage battery means within the battery compartment, a three position switch on the body portion having an intermediate power off terminal and horizontal and vertical mode operating terminals, a conductor interconnecting the three position switch with said storage battery means, said common conductor of each assembly being electrically connected with said switch horizontal and vertical mode operating terminals, whereby whenever one assembly is electrically energized the other assembly is non-energized to conserve battery power, the first chamber means comprising a single chamber containing the horizontal mode angle deviation indicator assembly, the second chamber means comprising a pair of separated chambers each containing a part of the vertical mode angle deviation indicator assembly, and said parts of the last-named assembly being electrically connected through said common conductor which is electrically connected to said switch vertical mode operating terminal.

4,506,451

MULTI-FUNCTIONAL SQUARE AND ANGLE MARKING TOOL HAVING EXTENDABLE STOPS

Paul J. Hiltz, 61 Barnstable St., Hull, Mass. 02045

Filed Nov. 17, 1983, Ser. No. 552,990
Int. Cl.³ B43L *7/00*
U.S. Cl. 33—451 **7 Claims**



1. A multi-functional square and angle marking tool comprising in combination:

a. a handle having at least one flat surface;

b. a body portion thinner than said handle having two parallel edges and two parallel sides, said body portion attached to said handle substantially in the center of said flat surface such that said parallel sides and edges extend perpendicularly from said surface;

c. a stop extendably mounted through said parallel sides of said body portion a selected distance from said flat surface;

d. means for securing said stop in a retracted position whereby said stop is positioned not to extend beyond either of said sides; and

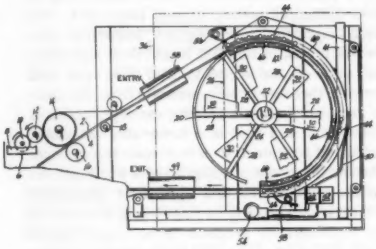
e. means for securing said stop in an extended position whereby said stop is positioned to extend beyond either of said sides.

4,506,452

METHOD AND APPARATUS FOR RF DRYING OF COATED ARTICLES

Harold R. Lillibridge, Burlingame, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Nov. 1, 1982, Ser. No. 438,023
Int. Cl.[3] F26B 3/34
U.S. Cl. 34—1 2 Claims



1. Apparatus for R.F. drying of gummed envelope flaps, said apparatus comprising:

(a) a drying roll journaled for rotational movement about an axis, said drying roll including a plurality of internal spokes having fan blades mounted thereon for circulating heat and moisture within said apparatus;

(b) cooperating carrier belts for carrying gummed envelopes, said belts traveling over the outer surface of said drying roll and positioned on said drying roll so that gummed flaps of envelopes carried by said belts will travel over a predetermined path and project beyond the edges of said belts and one edge of said drying roll;

(c) a curvilinear grid electrode support mounted adjacent to said edge of said drying roll;

(d) a plurality of grid electrodes mounted on said grid electrode support;

(e) grounding means for electrically grounding said grid electrode support;

(f) a curvilinear plate electrode support mounted adjacent to the edge of said drying roll and spaced apart from said grid electrode support;

(g) a plurality of plate electrodes mounted on said plate electrode support, said plate electrodes being staggered with respect to said grid electrodes, with said plate and grid electrodes being operable to establish an R.F. field comprising elliptical electron streams which pass through said envelope flap path at acute angles thereto, and said plate electrodes being spaced apart from the closest cooperating grid electrodes a distance in the range of two inches to two and one-quarter inches;

(h) electrically grounded tuning coils attached to each end of said plate electrode support to control the frequency of the R.F. field created by said plate and grid electrodes and prevent arcing;

(i) a housing encasing said drying roll and said plate and grid electrode supports to form a drying chamber;

(j) a D.C. generator disposed in said housing;

(k) an R.F. oscillator disposed in said housing and operably connected to said D.C. generator; and

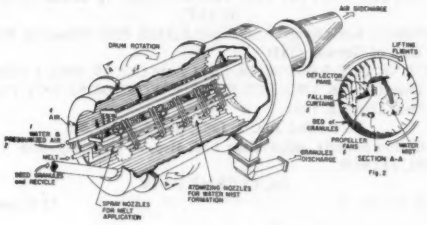
(l) conducting means interconnecting said oscillator with a medial point on said plate electrode support.

4,506,453

ENHANCED HEAT TRANSFER PROCESS BY FORCED GAS RECIRCULATION

Arthur R. Shirley, Jr., Florence, and Frederick T. Carney, Jr., Anderson, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 427,723, Sep. 29, 1982, Pat. No. 4,424,176.
This application Sep. 20, 1983, Ser. No. 534,006
Int. Cl.[3] F26B 3/04
U.S. Cl. 34—12 22 Claims



1. In an improved process for effecting heat transfer between solid particulate matter and gas within a defined volumetric space, which improved process comprises the steps of:

(1) alternately causing at least a portion of said particulate material in said defined volumetric space to be vertically displaced from and returned to a first zone therein, said particulate material in the descending attitude of vertical displacement generally defining a curtain, said curtain characterized by the fact that the first and second dimensions, height and width, thereof are substantially greater than the third dimension, depth, thereof and further characterized by the fact that the plane generally defined by said first and said second dimensions is vertically inclined at an angle ranging from about 90 degrees to the horizontal to about 5 degrees greater than the angle of repose of said particulate material;

(2) causing at least a portion of said gas in said defined volumetric space to be moved in a generally horizontal attitude in a manner so as to intersect said plane defined by said first and said second dimensions of said curtain, said generally horizontal movement of said gas being sufficient such that at least a portion thereof penetrates said curtain through the third dimension thereof with the contact angle between the generally horizontal attitude of said gas and said plane defined by said first and second dimensions of said curtain ranging from between about −45 degrees to about +45 degrees from the direction perpendicular to said plane of said curtain;

(3) causing at least a portion of said gas in said defined volumetric space having intersected and penetrated said curtain of particulate material therein to be displaced to a second zone in said defined volumetric space, said second zone being at least horizontally displaced away from said curtain of particulate material; and

(4) removing at least a portion of gas displaced into said second zone and returning same into contact with said curtain of returning particulate material to effect further heat transfer therewith by means of further penetration thereof as in step 2 supra;

said process characterized by the fact that the thermodynamic characteristics thereof as they relate to the heat transfer between said gas and said particulate material are represented as follows:

$$q_t = UaV(\Delta t)_m$$

where:

q_t=total heat transferred in the defined volumetric space, Btu/hr

Ua=volumetric heat transfer coefficient Btu/(hr)(ft^3 of defined volumetric space)(°F.)

V=volume of the defined volumetric space, ft^3

$(\Delta t)_m$=true mean temperature difference between the gas and the solid particles, °F.

said process further characterized by the fact that the value of Ua exceeds 25 Btu/(hr)(ft^3 of defined volumetric space)(°F.).

4,506,454

APPLIANCE FOR THE TREATMENT OF HAIR AND SCALP

Johann J. Kerschgens, Arabellastr.5/1815, 8000 München, Fed. Rep. of Germany (81)

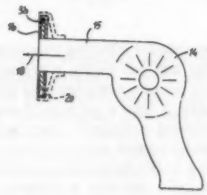
PCT No. PCT/EP82/00120, § 371 Date Oct. 15, 1982, § 102(e) Date Oct. 15, 1982, PCT Pub. No. WO82/04382, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 9, 1982, Ser. No. 438,865

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3123008

Int. Cl.^{3} F26B *23/04*

U.S. Cl. 34—4 **13 Claims**



1. A hand-held appliance for the treatment of hair and scalp, comprising in combination an electric motor-driven hair drier for applying cold or warm air to a human hair; and ultraviolet radiation means for applying a flow of radiation to a human scalp, said hair drier including a first housing having a tubular extension from which air streams are discharged, said ultraviolet radiation means including a second housing and an ultraviolet radiator enclosed in said second housing, said second housing being removably mountable on said tubular extension and being formed so that air from said drier is allowed to pass therethrough.

4,506,455

LOADING EQUIPMENT FOR LYOPHILIZATION APPARATUS

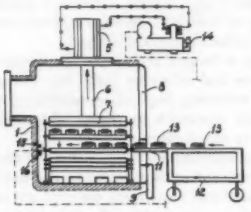
Gianrico Rossi, Pavia, Italy, assignor to Edwards Alto Vuoto S.p.A., Milan, Italy

Filed Jun. 10, 1983, Ser. No. 503,225

Claims priority, application Italy, Jun. 18, 1982, 2219482[U]

Int. Cl.^{3} F27D *3/12*; F26B *19/00*

U.S. Cl. 34—5 **4 Claims**



1. Loading equipment in combination with a lyophilization autoclave, wherein the autoclave comprises a lyophilization chamber with a full height door and a bottom and within the lyophilization chamber a rack of supporting plates for containers containing a substance to be subjected to lyophilization, said rack of plates, which rests on the bottom of the chamber, comprises a plurality of superimposed plates connected to one another by a plurality of adjustable support means, said adjustable support means permitting said rack of plates to be vertically collapsible and adapted to be contracted into a compact pack setting and adapted to be expanded into an expanded setting in which the plates are arranged at a predetermined vertical distance from one another sufficient for placing said containers therebetween, the autoclave further comprising an actuator for controlling the setting of said plate rack, said loading equipment comprising an auxiliary inspection port formed in the lower region of said full height door and effective to allow full view of, and access to, said plate rack, said loading equipment further comprising, separate from the autoclave, platform means including a loading carriage, which is manually provided near said port in a removably associable manner and guided and positioned so as to remain at a constant height level substantially corresponding to said loading level coinciding with the level of the first uppermost supporting plate in the plate rack, said loading carriage being effective to support thereon containers for products to be lyophilized in such a number and size as to correspond to the useful area of a carrier plate, said containers being manually transferable onto said plates as the latter are sequentially raised to the height level of said fixed loading platform, and held here for the time required to load, through a plurality of position sensors operatively coupled to a control unit for controlling said actuator.

4,506,456

METHOD FOR DRYING A POROUS WEB IN AN EXTENDED NIP PRESS

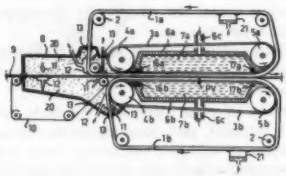
Jukka Lehtinen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Mar. 16, 1983, Ser. No. 475,840

Claims priority, application Finland, Apr. 6, 1982, 821207

Int. Cl.^{3} F26B *3/20*

U.S. Cl. 34—12 **9 Claims**



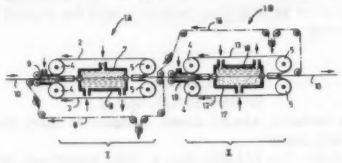
1. A method for drying a porous web, such as a paper and a cardboard web carried by at least one transporting means comprising: removing air from said web and said transporting means; passing said web and said transporting means between at least two impermeable to liquid surface elements defining an extended press zone, said surface elements being pressed toward each other in said press zone by means of pressure medium acting on them; subjecting surfaces of said web to a pressing effect by said surface elements; and keeping said transporting means in said press zone at a temperature lower than a temperature of said web and producing of a partial vacuum in said transporting means for duration of said pressing effect on said web;

and heating said web before said press zone to a temperature in an area of 100° C.

4,506,457
METHOD AND APPARATUS FOR DRYING A PAPER, OR SIMILAR, WEB

Jukka Lehtinen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Mar. 16, 1983, Ser. No. 475,839
Claims priority, application Finland, Apr. 6, 1982, 821208
Int. Cl.³ F26B 3/18
U.S. Cl. 34—41 9 Claims



1. A method for drying a paper, a cardboard and other porous, fibrous web having two opposite surfaces, said web having a direct contact with transporting means which comprises:

removing air from said wet web and said transporting means;

passing said web and said transporting means between moving surface elements having good heat conductive properties, said elements enclosing said web along a whole width thereof, said web and said transporting means having simultaneous contacts each with one of said moving surface elements;

heating of a smooth surface element contacting said web for evaporating a liquid contained in said web, and cooling a surface element contacting said transporting means for condensing vapors emanating from said web into said transporting means; and

separating said web from said transporting means,

whereby said drying method is carried out in at least two successive stages, each said surface of said web, during at least one said stage, being brought into a contact with a hot smooth surface element and at least in one further said stage into a contact with said transporting means.

4,506,458
CONTROL CIRCUIT FOR GAS HEATED APPLIANCE

Michael W. Cochrane, Lexington, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 13, 1984, Ser. No. 600,126
Int. Cl.³ F26B 19/00
U.S. Cl. 34—48 3 Claims

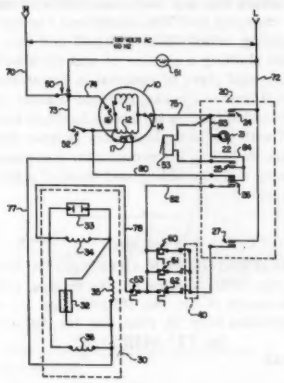
1. A control circuit for a gas heated appliance comprising:

an electrically operated timer means including a timer motor having a relatively high impedance motor winding and a plurality of contacts whose open and closed condition is dependent on the operation of the timer motor;

a single pole, single throw, thermostatic switch electrically connected in parallel relation across the timer motor winding, the interconnected winding and switch constituting a parallel network;

a gas burner regulation circuit electrically connected in series relationship with said parallel network, said burner regulation circuit having an impedance substantially less than the impedance of the timer motor winding, said interconnected winding, switch, and burner circuit constituting a series-parallel network and;

a pair of voltage applying power lines across which said series-parallel network is electrically connected via at least a portion of said plurality of contacts, wherein said lower impedance burner circuit operates only when said thermostatic switch is closed, voltage across said power lines being substantially fully applied to said burner circuit, said burner circuit being inoperative and said timer motor being operative when said thermostatic switch is open wherein a major portion of voltage across said power lines is applied to said higher impedance motor winding, said series-parallel network being electrically disconnected from at least one of said power lines when said portion of said plurality of contacts is opened by operation of said timer motor for a predetermined accu-

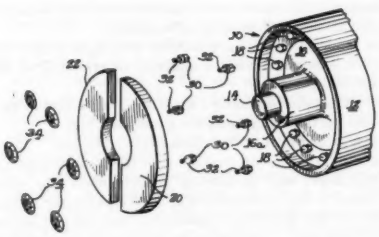


mulated period of time, said thermostatic switch being one of a plurality of single pole, single thrown, thermostatic switches, each operable at a different temperature condition, said control circuit including a user operated selector switch for electrically connecting only a selected one of said thermostatic switches in parallel relationship with said motor winding at any given time.

4,506,459
FASTENER ASSEMBLY FOR THERMAL INSULATION END PANEL FOR A PAPER MACHINE DRYER CYLINDER

Edwin G. Swick, Bartlett, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 21, 1983, Ser. No. 553,593
Int. Cl.³ F26B 13/18
U.S. Cl. 34—110 6 Claims



1. A fastener assembly for use with large heat transfer rolls and adapted for joining a sheet of insulating material to a protruding bolt head or the like which defines an axis, said fastener assembly comprising: a cup-like body defining a cavity for accepting said bolt head or the like and a quantity of high temperature adhesive material therewithin; means for retaining said body on said bolt head during setting of said adhesive material; a plurality of through apertures in said cup-like body for releasing any excess quantity of said adhesive material thereform; a cylindrical shaft portion integral with and projecting axially outwardly from said cup-like body and away from said bolt head and of sufficient axial extent to project

through said sheet of insulating material; enlarged head portion carried on an axially outermost end of said shaft portion; said enlarged head portion converges axially outwardly and includes a base of diameter greater than the diameter of said cylindrical shaft portion and is coupled therewith to thereby define a substantially annular, radially extending shoulder portion at the junction thereof; and a clamping member including a first surface defining therein a complementary fastener aperture for engaging said head means and a second, abutment surface extending radially outwardly of said first surface for overlying and abutting a portion of said sheet of material to thereby secure said sheet of material in juxtaposition to said protruding bolt head or the like; and said fastener head portion including a rounded leading surface to facilitate initial engagement thereof with said complementary fastener aperture, said leading surface including a depression for accepting a locating tool for locating and assembling said sheet of material on said fastener.

4,506,460

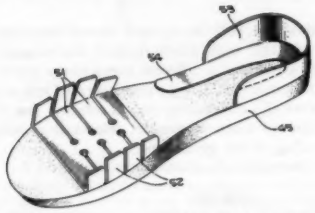
SPRING MODERATOR FOR ARTICLES OF FOOTWEAR

Marion F. Rudy, 19001 Vintage St., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 389,866, Jun. 18, 1982,. This application May 25, 1983, Ser. No. 496,411

Int. Cl.³ A43B *13/18*

U.S. Cl. 36—28 **21 Claims**



1. An article of footwear of the type described, comprising:

an upper and at least a sole secured to said upper such that the wearer's foot is positioned within said upper and above said sole,

cushioning material located between said sole and the wearer's foot,

a high modulus moderator located between the wearer's foot and above said cushioning material,

said moderator being a relatively thin, lightweight member of a material having a modulus of elasticity of at least 250,000 psi,

said moderator including a medial leg and a lateral leg and a heel portion interconnecting said two legs,

said legs and heel portion being relatively flat,

said moderator being positioned at least within said midsole and above said cushioning material such that when the wearer's foot is inserted into the footwear the medial and lateral legs overlie the cushioning material and are located on each side of the calcaneus while the rear portion of the moderator overlies the cushioning material and is located behind the calcaneus whereby a cushioning medium is provided below the calcaneus,

said moderator being charaterized further by the ability to deflect without permanent deformation in response to an applied load creating a deflecting stress and to return to its original shape upon removal of the applied load causing the deflecting stress,

said medial and lateral legs including peripheral portions spaced from the location of the calcaneus and portions adjacent to the location of the calcaneus whereby in response to a load the portions of said moderator adjacent to the calcaneus deflect in one direction while the portions thereof spaced from the calcaneus deflect in another direction,

said moderator including portions oriented approximately 90 degrees upward from the plane of the moderator and located at least along a portion of the medial and lateral legs thereof, and

said moderator being operative to absorb, redistribute and store the energy of localized loads applied thereto through deflection and to return energy to the wearer at a rate equal to or greater than the rate which the applied load is removed.

4,506,461

SPORT SHOE SOLE

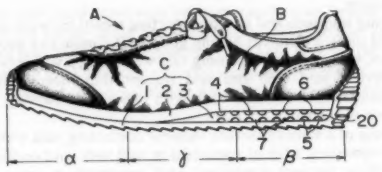
Masanobu Inohara, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan

Division of Ser. No. 174,894, Aug. 4, 1980, abandoned, which is a division of Ser. No. 896,477, Apr. 14, 1978, Pat. No. 4,236,326. This application May 28, 1982, Ser. No. 383,007

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ A43B *13/20, 21/28*

U.S. Cl. 36—29 **2 Claims**



1. A sole for use with sport shoes comprising a rigid abrasion-resistant ground sole, the ground sole having a heel portion, an arch portion, and a toe portion, a resilient and elastic interlayer body bonded to the entire upper surface of said ground sole, the interlayer body being provided with a plurality of parallel grooves at the heel portion and the arch portion only on the surface of the interlayer body which extend transversely all the way from one side to the other side and are open to the air at the side wall of the interlayer body, the cross section of each groove being semicircular.

4,506,462

RUNNING SHOE SOLE WITH PRONATION LIMITING HEEL

Peter R. Cavanagh, Pine Grove Mills, Pa., assignor to Puma-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,667

Int. Cl.³ A43B *7/16*

U.S. Cl. 36—92 **8 Claims**

1. A running shoe sole comprising:

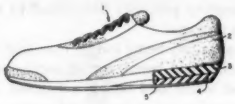
A. a relatively thin outer sole layer of relatively hard, wear-resistant material;

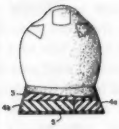
B. a midsole layer of resilient cushioning material for direct attachment to an upper of a running shoe, said midsole layer extending across substantially the full width of the running shoe sole and being of substantially uniform thickness and hardness thereacross; and

C. a heel sole layer provided between said outer sole layer and said midsole layer along approximately a rear half of the running shoe sole;

wherein said heel sole layer comprises an outer, longitudinally extending, portion on the lateral side of the running shoe sole and an inner, longitudinally extending, portion on the medial side of the running shoe sole, said outer portion spanning approximately two-thirds of the width of the heel sole layer and being formed of a resilient cushioning material having

approximately the same cushioning properties as the overlying material of the midsole layer, and said inner portion spanning approximately one-third of the width of the sole layer and being formed of a material that is of a hardness approximately





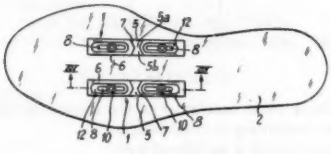
10–20 durometer greater than that of said outer portion, whereby said outer portion provides cushioning during lateral heel strikes occurring during running and said inner portion serves as a means acting for limiting pronation occurring thereafter.

4,506,463

PEDAL BLOCK FOR CYCLE SHOES

Jacques Chassaing, Neuviller les Saverne, France, assignor to Adidas Fabrique de Chassures de Sport, Landersheim, France

Filed Feb. 22, 1983, Ser. No. 468,187
Claims priority, application France, Feb. 22, 1982, 82 02882
Int. Cl.³ A43B 5/14
U.S. Cl. 36—131 **20 Claims**



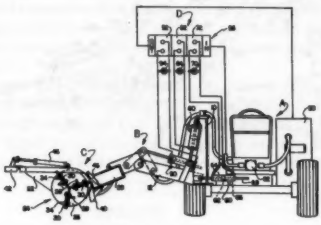
1. An adjustable pedal block arrangement for a cycle shoe comprising, a first elongated bar having a transverse groove, a second elongated bar having a transverse groove, said bars being positioned on a sole of the shoe with said grooves spaced apart in a direction transverse to the longitudinal axis of the sole, and said bars being mounted generally parallel to the longitudinal axis of the sole for individual longitudinal adjustment to a plurality of different longitudinal positions relative to each other and relative to the sole, and means for securing each bar to the sole in any of said plurality of different positions of longitudinal adjustment.

4,506,464

HYDRAULIC BREAKAWAY SYSTEM FOR MOBILE CUTTING APPARATUS

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Continuation-in-part of Ser. No. 416,579, Sep. 10, 1982, Pat. No. 4,459,767, which is a continuation-in-part of Ser. No. 416,596, Sep. 10, 1982, which is a continuation-in-part of Ser. No. 416,642, Sep. 10, 1982, abandoned. This application Feb. 6, 1984, Ser. No. 577,572
Int. Cl.³ E02F 9/08
U.S. Cl. 37—91 **13 Claims**



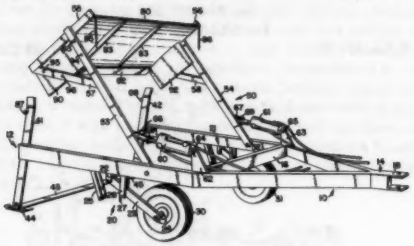
1. A mobile cutting apparatus comprising:
(a) a prime mover;
(b) an arm assembly operatively connected with the prime mover such that the arm assembly undergoes rotational movement relative to the prime mover;
(c) a cutting assembly operatively connected with the other end of the arm assembly;
(d) a hydraulic breakaway circuit including:
(i) a first through-rod-type hydraulic cylinder operatively connected with the arm assembly for controlling a rotational position of the arm assembly relative to the prime mover, the first cylinder including a cylinder housing, a piston slidably received within the cylinder housing dividing it into first and second chambers such that increasing the pressure in one chamber relative to the pressure in the other chamber causes the piston to move, and a through-rod extending from one end of the housing, through and fixedly attached to the piston, and through the other end of the housing, the rod having the same outer diameter in both the first and second chambers and the housing having the same inner diameter in both the first and second chambers such that the amount of fluid displaced from one of the chambers as the piston moves is the same as the amount of fluid required to maintain the other chamber filled;
(ii) a hydraulic fluid control valve for controlling the relative pressure in the first and second chambers of the first hydraulic cylinder, the first hydraulic control valve having a first port in fluid connection with the first chamber and a second port in fluid communication with the second chamber;
(iii) a first one-way, relief valve operatively connected between the first and second chambers for allowing fluid to flow from the first chamber to the second chamber when the pressure in the first chamber exceeds the pressure in the second chamber by a first preselected pressure, the first pressure relief valve prohibiting the flow of hydraulic fluid from the second chamber to the first chamber therethrough, whereby in response to the cutting assembly contacting a relatively immovable object which tends to cause the arm assembly to rotate in a first direction until the pressure differential exceeds the first preselected pressure and the first pressure relief valve permits fluid to flow between the hydraulic cylinder chambers allowing the arm assembly to rotate;
(iv) a fluid reservoir; and,
(v) a hydraulic fluid pump for pumping hydraulic fluid from the hydraulic fluid reservoir to the first hydraulic valve.

4,506,465

PIVOTABLE TOWED SNOW REMOVAL BLADE

Terry D. Johnson, Littleton, Colo., assignor to Melvin L. Robinson, Cherokee, Iowa, a part interest

Filed Dec. 22, 1982, Ser. No. 452,117
Int. Cl.³ E01H *5/06*
U.S. Cl. 37—268 **3 Claims**



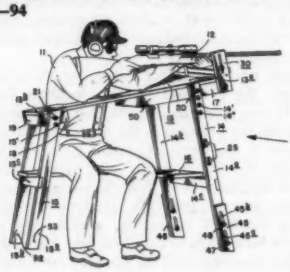
1. Snow removal apparatus comprising:
a rectangular frame and an adjustable wheeled suspension for supporting the frame in a raised transport position and a lowered snow removal position, said frame substantially open at one end and including a hitch at the other end for coupling to a prime mover;
a pair of vertical snow cutting knives mounted on opposite sides of the frame proximate the open end and extending downwardly from the frame in the lowered position to close proximity with the ground, each knife including a skid pad on the bottom end thereof;
whereby said vertical knives cut a quantity of snow loose from its position when the frame is moved along the ground; and
a blade and subframe assembly for supporting the blade in a lowered position wherein the blade is disposed for moving snow cut by said knives and in a raised position wherein the blade is suspended above the upper ends of said vertical knives, said subframe assembly comprising a pair of beams pivotably connected to opposite sides of the frame and a pair of double acting hydraulic cylinders mounted between said frame and beams for moving said blade between said raised and lowered positions.

4,506,466

PORTABLE SHOOTER'S BENCH

Stanley J. Hall, 443 Wells Rd., Doylestown, Pa. 18901

Filed Nov. 24, 1982, Ser. No. 444,284
Int. Cl.³ F41C *29/00;* **A47B** *3/14*
U.S. Cl. 42—94 **20 Claims**



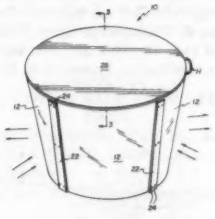
1. A portable bench adapted to be transported in a folded configuration and assembled readily in an erect configuration for use in shooting, comprising:
an elongated bench top having front and rear ends and elongated side edges intersecting said ends to define four corners and a lateral recess in at least one of said side edges between said ends,
a front leg assembly pivotally connected to said bench top adjacent its front end,
a rear leg assembly pivotally connected to said bench top adjacent its rear end,
said front leg assembly being longer than said rear leg assembly for causing said bench top to incline upwardly from rear to front when said bench is erected, said front and rear leg assemblies being sized with respect to one another to interdigitate into proximity with said top when said bench top and leg assemblies are arranged in their folded transport configuration,
a seat disposed directly below said lateral recess in said bench top and extending between and removably supported by said front and rear leg assemblies when said bench is errected, said seat being vertically below and substantially within the area encompassed by the four corners of the bench top when said bench is erected, and
means releasably connecting said seat to said leg assemblies,
said lateral recess in said bench top cooperating with the seat therebelow to enable a person to sit in the bench with his upper body disposed substantially entirely within the recess of the bench top and at about a 45° angle with respect to the length of the bench top when shooting a firearm,
whereby the inclination of the bench top and angular disposition of the person's body with respect thereto aid the person in aiming the firearm naturally.

4,506,467

PORTABLE MIRROR BLIND

Norman Strung, Up Cottonwood Canyon, Bozeman, Mont. 59715

Filed May 12, 1983, Ser. No. 493,830
Int. Cl.³ A01M *31/02*
U.S. Cl. 43—1 **12 Claims**

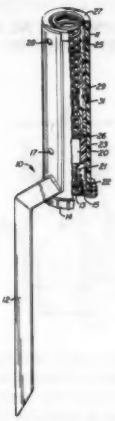


1. A portable blind simulative of the associated adjacent environment comprising in combination:
an enclosure having a peripheral wall,
and means on an outer surface of said wall to reflect accurately the immediately adjacent environment,
wherein said reflective means comprises a mirrored surface,
wherein said enclosure is formed from a plurality of panels provided with means to separate adjacent panels for storage,
wherein said means to separate said panels comprises channel means running along side edges of adjacent panels interconnecting said panels, and
wherein said interconnecting channel means for two adjacent panels is enhanced by means of pin shaped members adapted to traverse through each said panel and said channel.

4,506,468
FISH ALERTER

Emzlie A. Willhite, 1840 Pleasant Hill Rd., Sebastopol, Calif. 95472

Filed Nov. 14, 1983, Ser. No. 550,845
Int. Cl.[3] A01K *97/10*
U.S. Cl. 43—17 14 Claims

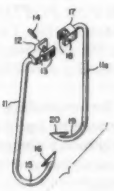


1. A fishing rod holder and alarm for use with a fishing rod of the type having an elongate handle, comprising:
an elongate hollow housing having an open first end and a second end;
a conductive ring mounted to the inside surface of the housing near the first end;
a conductive spring mounted within the housing;
means for centering a first portion of the spring within the housing and leaving a second portion of the spring adjacent the conductive ring free to be bent in any radical direction; and
an alarm circuit, including the ring, the spring, and an alarm device, said alarm circuit being adapted to be completed and to actuate the alarm when the fishing pole radially biases the spring to contact the ring.

4,506,469
TWIN FISH HOOK

Juanito B. Calagui, 55-56 Calle Uno St., Caloocan City, Metro Manila, Philippines

Filed Jul. 20, 1983, Ser. No. 519,176
Claims priority, application Philippines, Jan. 24, 1983, 8214[U]
Int. Cl.[3] A01K *83/00*
U.S. Cl. 43—34 7 Claims

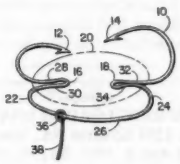


1. A fish hook comprising:
(a) first and second oppositely disposed shanks having upper and lower ends and extending vertically;
(b) a first fork member at the upper end of said first shank and a second fork member at the upper end of said second shank and fitting within said first fork member;
(c) a connecting pin pivotably connecting said first fork member to said second fork member such that said first and second shanks are pivotable in respective first and second parallel planes; and
(d) first and second hooks disposed at said lower ends of said respective first and second shanks; and
wherein said fish hook is disposable in:
(i) a normal position in which said first and second hooks are in coinciding and oppositely facing relatively close positions in said respective first and second parallel planes; and
(ii) a diverged position in which said first and second shanks are crossing each other and said first and second hooks are spread apart;
and wherein said fish hook is operative to change from said normal position to said diverged position when a fish bites on said lower ends to cause said first and second shanks to pivot such that said upper ends move closer together and said lower ends including said first and second hooks move further apart.

4,506,470
FISH HOOK

Charles C. Adams, 243 N. Avalon, Memphis, Tenn. 38112

Filed Apr. 8, 1983, Ser. No. 483,141
Int. Cl.[3] A01K *83/06*
U.S. Cl. 43—44.8 17 Claims



1. A fish hook comprising a wire form having at least one spear at each end thereof, said wire form having a bend extending from each spear such that spears at one end are spaced from and directed towards spears at the other end, each bend flaring away from the respective end and continuing toward a prong spaced from the respective end to form a substantially U-shaped configuration from the prong to the respective end, said prongs being sharp protuberance means spaced apart to be received within a lure or the like, said wire form further having a line attaching portion comprising an additional bend in said wire form connecting said prongs and extending adjacent each prong and then flaring away from the prongs, the spacing between said line receiving portion and said prongs being closer than the spacing between said line receiving portion and said ends.

4,506,471
LINE ATTACHMENT FOR FISHING FLOAT

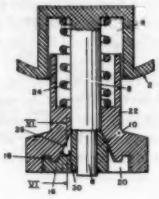
John T. Riead, Cameron, Mo., assignor to Rieadco Corporation, Cameron, Mo.

Filed Sep. 19, 1983, Ser. No. 533,436
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.[3] A01K *93/00*
U.S. Cl. 43—44.87 4 Claims

1. A fishing line attachment device for a fishing float having a buoyant body member, said device comprising:
a. an elongated stem fixed at one end in said body member and projecting outwardly therefrom, the outer end portion of said stem being enlarged to form a head having a surface confronting said body member, said surface having an open-ended groove formed therein in which a fishing line may be laid, said groove being disposed in a

plane parallel to said stem but laterally offset therefrom, and opening at its ends through the outer end of said head,

b. a plunger mounted for sliding movement on said stem intermediate said body member and said stem head, and having at its outer end a socket cavity providing a surface operable when said plunger is moved outwardly to mate with said head surface to close the open side but not the ends of said groove, whereby to constitute said groove as an open-ended tunnel through which said fishing line may run freely, and



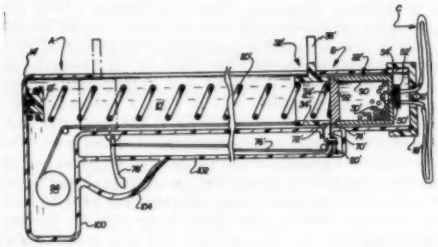
c. s spring biasing said plunger yieldably outwardly along said stem, said plunger being manually retractable against said spring to open said groove, said mating surfaces of said head and said plunger being conical in form, taperingly reduced in diameter toward said body member, whereby the force of said spring when urging said plunger to clamp a fishing line between said head and plunger surfaces is magnified by the conical form of said surfaces.

4,506,472

SPRING-LOADED SNARE

David A. Barman, 2250 Scranton Rd., Norwalk, Ohio 44357

Filed Apr. 4, 1983, Ser. No. 481,801
Int. Cl.³ A01M *23/34*
U.S. Cl. 43—87 **11 Claims**



1. A lethal spring-loaded snare comprising:

a sturdy elongated tubular member defining an internal passage longitudinally therein;

an adjustable inertia means for providing a selectable inertial force, the inertia means being disposed in the internal passage for movement therealong;

an elongated, flexible cable having at least one end operatively connected with the inertia means, the cable defining a closed loop which is selectively contracted by the inertia means with said selected inertial force;

a cocking means for causing the inertia means to store potential energy;

triggering means for selectively causing the inertia means to convert the stored potential energy to a corresponding amount of kinetic energy to contract the cable loop with the selected inertial force; and,

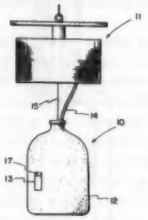
adjustment means for adjusting the amount of potential energy stored by the inertia means, such that the selected inertial force with which the loop is contracted is adjusted to be sufficiently great to break the neck of a preselected prey yet sufficiently small that the pelt is undamaged.

4,506,473

CARBON DIOXIDE GENERATOR INSECT ATTRACTANT

John Waters, Jr., Swansboro, N.C., assignor to John G. Mills, II, Wake Forest, N.C.

Filed Nov. 14, 1983, Ser. No. 551,212
Int. Cl.³ A01M *1/02*
U.S. Cl. 43—107 **10 Claims**



1. A device for generating carbon dioxide as an insect attractant in combination with an insect trap, comprising: a reaction chamber means; means connecting between said chamber means and said trap; an area within said chamber means containing a carbonate salt; a compartment means within said chamber means containing an aqueous acid solution; and means for bringing said acid solution in contact with said carbonate salt whereby carbon dioxide can be generated in said chamber and passed through said communicating means into said trap to act as an insect attractant.

4,506,474

USE OF NIGHT-BREAK LIGHTING TO INCREASE FRUIT SET IN ECONOMICALLY IMPORTANT FRUIT CROPS

Prakash G. Kadkade, Marlborough, and Charles R. Botticelli, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 12, 1980, Ser. No. 148,885
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **2 Claims**

1. A method for increasing fruit set in a crop comprising, over a time span of at least 30 days, repeatedly exposing said crop with 660 nm light for periods of 1 to 240 minutes daily, during the night times from bloom time for said crop to early fruit development for said crop, wherein said 660 nm light is obtained from a high intensity discharge-lithium filled metal halide light source having an intensity range of 1 $\mu W/cm^2$ to 400 $\mu W/cm^2$.

4,506,475

HANGER FOR POTTED PLANTS

James J. Elliott, 700 Museum Dr., Charlotte, N.C. 28207

Filed May 10, 1983, Ser. No. 493,340
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—67 **3 Claims**

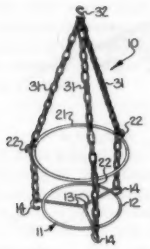
1. A hanger device for suspending plant containers of various sizes, and characterized by being particularly constructed for suspending relatively heavy plant containers, such as terra-cotta pots and their accompanying terra-cotta saucers, said hanger device comprising

a support base comprised of a circular ring and a plurality of spokes, at least three in number, extending radially outwardly from the center of the ring, said ring and said spokes defining an upper surface portion for supporting a plant container thereon, at least three of said spokes ex-

tending radially outwardly beyond the perimeter of said circular ring and terminating in a hook formation depending downwardly from said ring in the form of a loop such that the respective hook formations collectively serve as feet for said support base when the hanger device is disassembled,

a respective supporting chain connected to each one of said hook formations and extending upwardly therefrom, each chain being comprised of a series of interconnected links,

means connecting together the upper ends of each of said chains for suspending the hanger device from a support,



a circular retainer ring removably and adjustably positioned in spaced relation above said support base and inside of said chains, said retainer ring having a diameter larger than that of said support base and adapted for surrounding a plant container, and said retainer ring including three fingers projecting radially outwardly at substantially equally spaced apart locations about the circumference thereof, said fingers extending respectively into selected ones of the links of said chains with said fingers being removable from said chains for thereby adjustably supporting the retainer ring at a selected distance above the base depending upon the height of the container.

4,506,476

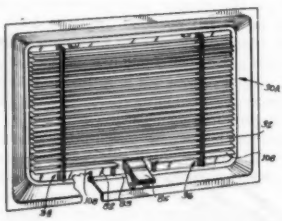
VEHICULAR BLINDS

Richard K. Haines, P.O. Box 2177, Elkhart, Ind. 46514

Filed May 27, 1983, Ser. No. 498,927

Int. Cl.³ E05B *7/08*

U.S. Cl. 49—64 **7 Claims**



1. A window blind for assembly with a vehicle window in a window opening and presenting upper and lower edge portions comprising: a plurality of slats, first and second upstanding spaced apart framework members respectively including first and second upstanding spaced apart elongated members and a plurality of slat supporting struts extending between said first and second elongated members, a plurality of pivotal connecting means pivotally connecting opposite ends of said struts respectively to said first and second elongated members, and a plurality of upper and lower securement means respectively connected to upper and lower ends of said first elongated members for securing said first elongated members in fixed relationship to said window, said slats respectively being supported at opposite end portion locations spaced inwardly from terminal ends thereof by an associated strut, each of said struts including upwardly facing edge means extending substantially between the associated first and second elongated members and supporting said slats, said second elongated members being unsupported except for the pivotal connections with the struts and projecting forwardly of the struts so that they may be manually manipulated up and down for adjusting the position of the slats, at least one of the pivotal connecting means connecting the struts to the elongated members resisting pivotal movement sufficiently to prevent adjustment of the slats in the absence of manual manipulation of one of said elongated members.

4,506,477

CURTAIN ROD FOR SLIDING GLASS DOOR

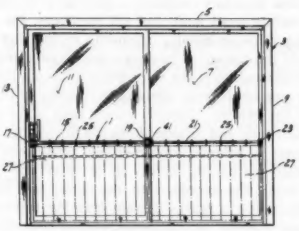
Ross M. Castle, 100 Castle Dr., Florissant, Mo. 63034

Continuation-in-part of Ser. No. 77,004, Sep. 19, 1979, Pat. No. 4,277,913. This application Jul. 14, 1981, Ser. No. 283,234

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.³ E06B *7/00*

U.S. Cl. 49—70 **8 Claims**



1. A curtain rod for a sliding glass door in a wall, said curtain rod comprising:

a first rod section;

first means for mounting the first rod section on the door in position extending generally horizontally across a face of the door, said rod section being spaced laterally from said face for supporting a plurality of hooks or the like;

a second rod section;

second means for mounting the second rod section independently of the door in axial alignment with the first rod section;

said rod sections having a sliding fit with respect to each other and constituting an extensible assembly, said assembly being extended as the door is closed and contracted as the door is opened, said assembly being adapted to support a curtain extending across the face of the door in both closed and open positions of the door; and

locking means for selectively preventing contraction of said assembly and thus the opening of the door, the locking means comprising at least one hole in one of the rod sections and a locking ring adapted to be applied to said one rod section for providing a fixed external shoulder thereon engageable with a stop member alongside said one rod section, said locking ring comprising a first elongate portion having a generally closed shape and spaced-apart ends, the ring being adapted to be carried on said one rod section being adapted in a position in which said first portion of the ring substantially surrounds said one rod section, and a second elongate portion extending from one end of the first portion inwardly with respect to said closed shape, said second portion forming a prong receivable in the hole in said one rod section when the ring is in said position surrounding the rod section thereby to re-

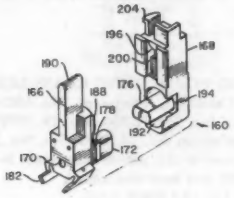
leasably secure the ring on said one rod section in fixed axial position with respect thereto.

4,506,478

WINDOW STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.

Division of Ser. No. 50,818, Jun. 21, 1979, Pat. No. 4,398,372.
This application Aug. 16, 1983, Ser. No. 523,415
Int. Cl.³ E05D *15/22*
U.S. Cl. 49—181 **16 Claims**



1. Window structure including a generally rectangular outer frame including head jamb and sill members, the jamb members having a longitudinally extending recess therein opening inwardly of the frame, at least one sash positioned within the frame including stiles at the sides thereof having longitudinally extending recesses therein opening outwardly of the sash and a lift rail at the bottom thereof, which sash is movable in the plane of the frame and tiltable about the lift rail out of the plane of the frame, a balance foot member positioned within the longitudinally extending recess in at least one frame jamb movable along the recess with the sash, said balance foot member including a recess therein opening toward said sash and a torque transfer projection extending centrally from said recess in said balance foot member toward said sash in spaced relation to the side walls of said recess in said balance foot member, and a lower sash guide member secured to the sash stile within the recess therein adjacent the lift rail including a cylindrical hollow pivot portion extending therefrom toward the frame jamb receiving the torque transfer projection on the balance foot member extending axially thereinto and itself extending axially into the recess in the balance foot member, said balance foot member and lower sash guide member comprising a balance foot and lower sash guide structure guiding the sash in movement in the plane of the window and providing a pivot for the sash about the lift rail.

4,506,479

ROOF OR WALL COVERING AND MOUNTING MEMBER FOR A GUTTER BRACKET

John E. Matthisoa-Hansen, No. 16 Lille Lyngbyvej, DK-3320 Skevinge, Denmark

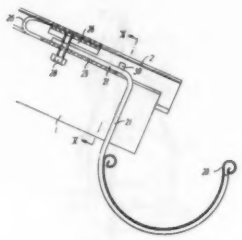
PCT No. PCT/DK82/00050, § 371 Date Jan. 25, 1983, § 102(e) Date Jan. 25, 1983, PCT Pub. No. WO82/04457, PCT Pub. Date Dec. 23, 1982
PCT Filed May 26, 1982, Ser. No. 463,871
Claims priority, application Denmark, Jun. 11, 1981, 2547/81
Int. Cl.³ E04D *13/00*
U.S. Cl. 52—15 **5 Claims**

1. A roof or wall covering comprising alternate first and second cover strips made of sheet material and formed with respective, resiliently interengaging longitudinal edge zones;

and fastening members for securing the covering to a supporting substructure;

wherein each said first cover strip has an outwardly concave central part merging into two longitudinal edge zones, the cross sectional profile of which is S-shaped and comprises an inner portion adjoining the central part of the strip and curved towards the concave face of said central part, said inner portion having a first radius of curvature, a median portion curved in the opposite direction and having a second, smaller radius of curvature, and an outer portion having a third radius of curvature larger than the first radius of curvature;

each said fastening member being formed as a U-shaped bracket having a web portion for securing to the substructure and two lateral flanges, the free edge zones of which are profiled complementary to the edge zones of the first cover strips and are curved inwardly towards the center line of the U at the transition of the adjoining portion of the respective lateral flange;



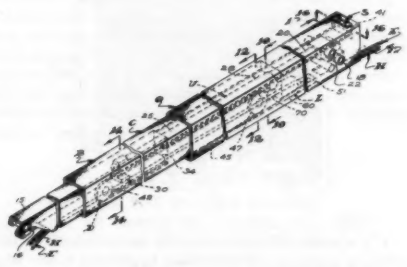
and each said second cover strip having an outwardly convex central part substantially narrower than the central part of the first cover strips and merging into two longitudinal edge zones the cross sectional profile of which is complementary to the median and outer portions of the edge zones of the first cover strips so that said outer portion of the edge zone of the first cover strip fits into a lateral flange of a fastening member and an edge zone of a second cover strip fits thereover to hold the assembly thereof together.

4,506,480

EXTENSIBLE BOOM CONSTRUCTION FOR SELF-PROPELLED AERIAL WORK PLATFORMS

William D. Murrill, Downey, and Bryan Langseth, Whittier, both of Calif., assignors to Calavar Corporation, Santa Fe Springs, Calif.

Filed Mar. 10, 1983, Ser. No. 474,050
Int. Cl.³ E04H *12/34*
U.S. Cl. 52—121 **6 Claims**



1. An axially extensible boom assembly, comprising:

a tubular outer boom section, a tubular intermediate boom section, and a tubular inner boom section supported in a telescoping relationship and movable between a retracted position and an extended position and providing a forward end portion and a rearward end portion of the boom assembly;

power means interconnected with the boom sections for moving the intermediate boom section within and relative to the outer boom section and for moving the inner boom

section within and relative to the intermediate boom section;

at least one elongate, flexible power conducting line extending through the boom assembly and accessible adjacent the forward and rearwards ends thereof; and

an articulated, hollow track member extending axially within the boom section, which receives and guards said power conducting line from damage during relative movement of the boom sections, the forward end of the track member being fastened to the inner boom section and the rear portion of the track member being doubled-back in the forward direction with the rear end thereof fastened to the outer boom section, whereby when the assembly is moved to the retracted position the amount of said doubling-back is increased and when the assembly is moved to the extended position the amount of the doubling-back is decreased.

4,506,481

ELEMENT MOULDING OF METAL MESH

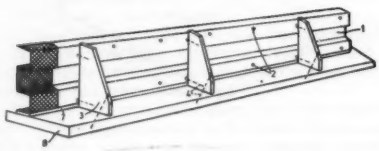
Heinz Witschi, Eigerweg 14, 3073 Gümligen, Canton of Berne, and Peter Fankhauser, Sonnrainstrasse 13, 3510 Konolfingen, Canton of Berne, both of Switzerland

Continuation of Ser. No. 255,504, Apr. 20, 1981,. This application Aug. 5, 1983, Ser. No. 520,223

Claims priority, application Switzerland, May 1, 1980, 3384/80

Int. Cl.³ E04C *3/16*

U.S. Cl. 52—127.2 **15 Claims**



1. Apparatus for use in a two-stage concrete pouring construction process such as pouring floors or ceilings for buildings, comprising:

a horizontal shuttering;

an element moulding for use as a sunken shuttering comprising a rigid profile metal mesh on said horizontal shuttering, said mesh having two longitudinal edges;

a plank liner arranged between the metal mesh and the horizontal shuttering for spacing the mesh from the horizontal shuttering, said plank liner being removable before the concrete pouring of the second stage;

a plurality of horizontally oriented reinforcing bars;

perforation means in said element moulding for introducing the plurality of horizontally oriented reinforcing bars, said perforation means being disposed in two parallel lines, each line laying near one of the two longitudinal edges of the element moulding; and

support means for laterally buttressing the element moulding metal mesh on one side and to be fixed to said horizontal shuttering before the introduction of the concrete pouring of a first stage, and removable before the concrete pouring of the second stage.

4,506,482

PREFABRICATED PANEL FOR BUILDING WALL CONSTRUCTION AND METHOD OF MAKING SAME

Hans J. Pracht, 1318 Mile Post Dr., Dunwoody, Ga. 30338, and Thomas Obermeier, 1700 Forest Pkwy., Denver, Colo. 80220

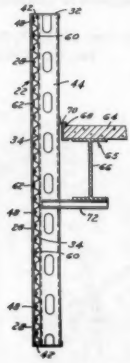
Filed Feb. 10, 1983, Ser. No. 465,591

Int. Cl.³ E04B *2/88*

U.S. Cl. 52—235 **18 Claims**

1. In a wall structure for a building having a plurality of prefabricated panel sections secured to the building framework to form a wall surface, each panel section comprising:

a rigid support structure for attachment to the building framework including a structural frame and a formed metal deck secured to the frame, said deck having alternating ridges and grooves;



a plurality of facia sheets overlying one side of said support structure, said sheets formed of material selected from the group consisting of ceramics and masonry;

means for resiliently securing the facia sheets to the support structure for permitted limited relative movement therebetween; and

means for sealing the joints between adjacent edges of the facia sheets.

4,506,483

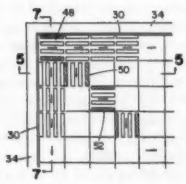
ROOF CONSTRUCTION

Thomas E. Phalen, Jr., Winchester, Mass., assignor to Roofblok Limited, Fitchburg, Mass.

Filed Aug. 5, 1983, Ser. No. 520,648

Int. Cl.³ E04D *3/02*

U.S. Cl. 52—408 **6 Claims**



1. In a roof construction comprising a deck having at least one rectangular corner, a membrane, and a layer of abutting rows of ballast blocks laid above said membrane, each of said blocks having two parallel edges bevelled at substantially identical angles of 12° to 23° from the vertical, the remaining two edges being substantially vertical,

the improvement which comprises having the blocks in said corner in a pattern in which the outer rows of said blocks except for the corner blocks are arranged with outwardly and downwardly bevelled edges adjacent to the edge of the deck,

and means for clamping said block edges to said deck,

each successive row of blocks inwardly from said outer row having the same alignment as said outer row except for the corner block at the intersection of the rows,

each corner block in each row being in alignment with either of the two rows of which it forms a corner,

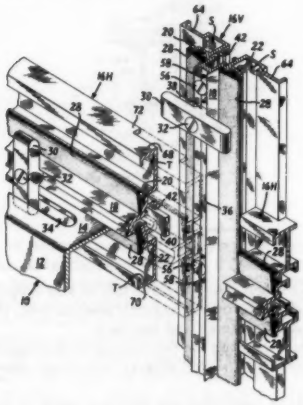
said pattern extending inwardly from each edge of the roof corner for at least ten rows.

4,506,484

PANEL WALL SYSTEM

Gary F. Bartlett, Muncy, Pa., and Robert W. Olsen, New Providence, N.J., assignors to Construction Specialties, Inc., Cranford, N.J.

Filed Jun. 23, 1983, Ser. No. 507,715
Int. Cl.³ E04B 5/52
U.S. Cl. 52—476 **8 Claims**



1. An exterior panel wall assembly having a multiplicity of rectangular pan-like panels arranged in closely spaced-apart relation side by side and end to end, each panel having a principal wall forming a portion of an exterior building wall and a continuous peripheral flange extending inwardly from the principal wall toward the building structure, an elongated vertical retainer joined to building structure and located at and coextensive with each vertical flange of each panel and an elongated horizontal retainer joined to the building structure and located at and coextensive with each horizontal flange of each panel, each retainer having a web portion that at least partly overlaps a portion of the flange of each panel adjacent to it and a lateral seating flange portion extending outwardly from the web portion, underlying the edge of the flange of the panel adjacent to it and constituting a seating surface for that flange edge, and attachment clips fastened to the web portions of the retainers, each clip having an arm extending outwardly through a slot in the flange of the adjacent panel, characterized in that each horizontal retainer has a lon_gitudinally continuous drainage trough located within the space bounded by the flange of the corresponding panel to receive water that might otherwise collect in said space or leak toward the building structure, and each vertical retainer has a longitudinally continuous drainage slot serving the drainage trough of each adjacent horizontal retainer, each trough opening to the drainage slot of the adjacent vertical retainer.

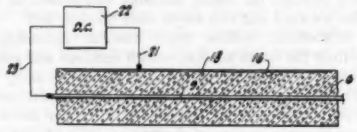
4,506,485

PROCESS FOR INHIBITING CORROSION OF METAL EMBEDDED IN CONCRETE AND A REINFORCED CONCRETE CONSTRUCTION

John A. Apostolos, Sacramento, Calif., assignor to State of California, Department of Transportation, Sacramento, Calif.

Filed Apr. 12, 1983, Ser. No. 484,305
Int. Cl.³ B27K 1/00
U.S. Cl. 52—515 **9 Claims**

1. A process for inhibiting corrosion of iron embedded in concrete wherein the concrete has an exterior exposed to a moist, saline environment comprising sandblasting said exterior to remove the existing surface thereof and to leave a newly exposed surface thereon, then promptly flame-spraying a metal



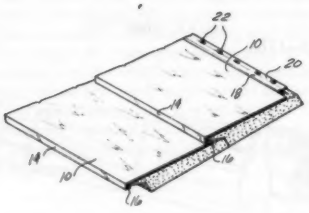
onto at least part of said newly exposed surface, to form a cover thereon, and then connecting said cover and said iron in a circuit containing a source of electricity.

4,506,486

COMPOSITE SIDING PANEL

Bertram C. Culpepper, Jr., Fenton, and Richard C. Wilson, West Bloomfield, both of Mich., assignors to Culpepper & Wilson, Inc., Fenton, Mich.

Continuation of Ser. No. 328,471, Dec. 8, 1981,. This application Feb. 1, 1984, Ser. No. 576,169
Int. Cl.³ E04D 1/28
U.S. Cl. 52—529 **3 Claims**



1. A composite siding panel comprising:

an outer panel formed of a weather impervious material and having first and second spaced, longitudinally extending edges;

means defining a nailing strip on one of the first and second longitudinal edges of the outer panel for mounting the outer panel on a building;

an elongated insulating member formed of a foamed insulating material mounted on the inner surface of the outer panel, the insulating member having first and second longitudinally extending edges;

an under cut recess formed in and extending along the first longitudinal edge of the insulating member said recess having a plurality of sides of which one side forms an acute angle at the junction of said composite siding panel and building;

a projection complementary to the recess formed in and extending along the second longitudinal edge of the insulating member, the projection extending outward beyond one edge of the outer panel a greater distance than the depth of the under cut recess; and

first and second interlocking means extending along opposed first and second longitudinal edges of the outer panel for interlocking outer panels of two adjacent panels in parallel, abutting relationship, the first interlocking means being disposed within the recess in the insulating member;

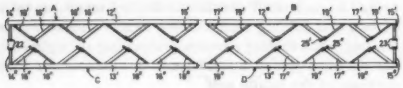
the width of the insulating member being greater than the width of the outer panel by a pre-determined amount such that the adjacent longitudinal edges of two insulating members are compressed against each other upon the interlocking of two adjacent siding panels to which the insulating members are mounted.

4,506,487

STEEL TRUSS

Arne Hill, Malmgårdsvägen 32, S-116 38 Stockholm, Sweden

Filed Mar. 10, 1983, Ser. No. 473,959
Int. Cl.³ E04C *3/02*
U.S. Cl. 52—690 **5 Claims**



1. A completed steel truss which is composed of prefabricated, longitudinally extending truss sections, said truss sections each having a height which is approximately only half the height of the completed steel truss and the completed steel truss comprises an upper longitudinal beam, a lower longitudinal beam, and a plurality of straight ties and struts that interconnect said upper and lower beams to thereby form a lattice within the plane defined by said upper and lower beams, said ties and struts being obliquely arranged with respect to each other so that each tie will intersect an associated strut at a point approximately midway between said upper and lower beams, wherein

(a) each of said ties and struts is composed of an upper part secured to and extending obliquely downwardly from said upper beam and a lower part secured to and extending obliquely upwardly from said lower beam, said upper and lower parts of associated ties and struts meeting and being united in a common joint,

and wherein in each common joint

(b) said upper and lower tie parts have flat end portions of equal thicknesses lying approximately end-to-end in a common plane forming a right angle to the plane between said upper and lower beams, and

(c) said upper and lower strut parts have their respective ends secured approximately to the center of each one of two opposite connection plates of generally equal size lying in planes parallel to said flat end portions of said associated tie parts and having said flat end portions interposed and retained between them,

each prefabricated truss section comprising one of said two longitudinal beams and the tie and strut parts secured thereto, and said connection plates in each joint serving as splice plates for the tie parts of the respective truss sections when the tie parts and strut parts are joined together.

4,506,488

WRAPPING MACHINE AND METHOD

Timothy S. Matt, Bay Village, and James B. Wensink, North Olmsted, both of Ohio, assignors to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed May 13, 1983, Ser. No. 494,130
Int. Cl.³ B65B *9/06, 57/00*
U.S. Cl. 53—55 **30 Claims**

1. A method of wrapping products in packages formed from a continuous film of packaging material with each package containing a cut length of film, comprising the steps of:

shaping a continuous film of packaging material with a former by drawing the film past the former into the shape of a continuous tube;

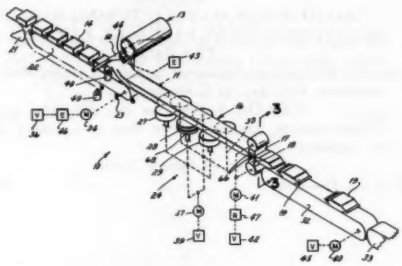
drawing the continuous film of packaging material past the former and past a cutting and sealing station, at which the tube of packaging material is cut and sealed at cut points nominally coincident with the ends of the cut lengths, at a velocity dependent upon a film velocity control signal;

feeding products to be packaged into the former and the continuous tube of packaging material at a rate dependent upon a product infeed rate control signal;

producing the film velocity control signal and the product infeed rate control signal to maintain the film velocity and the product infeed rate such that a product is fed into the former for each cut length of film drawn past the former;

determining the relative orientation between each product and its associated cut length of film moving past the film former;

determining if the relative orientation between a product and its associated cut length of film is such that the product is closer than a selected allowable distance to a cut point;



adjusting the location of a cut point if a product lies closer to the cut point than said allowable distance; and

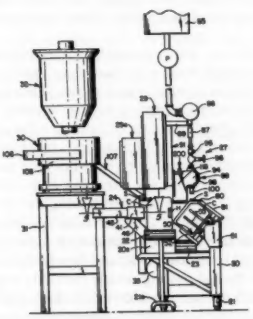
cutting and sealing the continuous tube of packaging material at each cut point, as adjusted if necessary, as each product moves past the cutting and sealing station.

4,506,489

FILLER AND CAPPER FOR CONTAINERS

Warren J. Schieser, Dublin; Stanley E. Vickers, Hideaway Hills, and Craig L. Duffey, Galena, all of Ohio, assignors to Liqui-Box Corporation, Worthington, Ohio

Filed Aug. 15, 1983, Ser. No. 523,075
Int. Cl.³ B65B *57/00, 3/26, 7/28*
U.S. Cl. 53—64 **49 Claims**



1. A machine for filling and capping containers comprising an infeed conveyor for supplying containers to an infeed position which includes a container crossfeed mounted in cooperation with said infeed conveyor to move a group of containers of predetermined number off the infeed conveyor, a container guide mounted along the infeed conveyor for receiving the group of containers and adapted to orient the containers with their spouts in position for the containers to be filled and capped, an infeed advancer mounted in cooperation with the guide for advancing the group of containers along the guide to a filling and capping position which includes fillheads corresponding in number and position to the spouts of said group of containers, individual cappers mounted for movement into cooperation with the spouts of the filled containers of the

group, means for feeding caps to said cappers, and means for actuating said cappers to apply caps to said spouts, the group of filled and capped containers being moved to a discharge position by said infeed advancer causing the next group of containers to advance along the guide to the filling and capping position.

4,506,490

MACHINE FOR MANUFACTURING BAG-LIKE TWO-COMPARTMENT PACKAGES, PARTICULARLY TEA BAGS

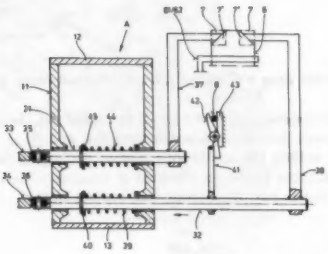
Gerhard Klar, Friedrichshafener Strasse 10, D8992 Wasserburg, Bodensee, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,662

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038442

Int. Cl.³ B65B *29/04*

U.S. Cl. 53—134 **8 Claims**



1. A machine for manufacturing a two-compartment bag having a tag connected thereto by a thread, and made from a strand of pliant material which is folded into a flexible tube and is filled with separate serving amounts of a substance comprising:

conveyor means defining a conveyor path;

at least one work station engaged with said conveyor means for movement of said work station along said conveyor path;

a plurality of cam rails extending parallel to said conveyor path and spaced from said conveyor means;

said work station comprising a closed housing defining an interior space, end folding means movably mounted to said housing having a pair of folding elements for folding ends of a strand from which a bag is to be made, elevating means movably mounted to said housing and including a pair of elevating arms for engaging ends of a strand from which a bag is to be made for moving the strand ends into an upright position, strand cutting means movably mounted to said housing including a least one strand cutting element for cutting a strand from which a bag is to be made, and thread cutting means movably mounted to said housing and including at least one thread cutting element for cutting a thread which connects a tag to a strand from which a bag is to be made;

each of said folding means, elevating means, strand cutting means and thread cutting means including at least one shaft movably mounted to said housing and having a first portion extending in said interior space and a second portion extending out of said interior space, each shaft being parallel to each other shaft and being one of rotatably and axially movable with respect to said housing;

at least one of said folding elements, at least one of said elevating arms, said at least one strand cutting element and said at least one thread cutting element each being engaged to said second portion of a shaft;

cam rail engaging means extending into said housing and connected to each first portion of each shaft, each cam engaging means including a cam rail engaging element movable into engagement with at least one of said cam rails, so that movement of said closed housing on said conveyor path causes relative movement between each cam rail engaging element and at least one of said cam rails to move said end folding means, said elevating means, said strand cutting means and said thread cutting means; and

said end folding means including said at least one shaft and one additional shaft, each of said folding elements connected to each shaft of said end folding means, each shaft of said end folding means being axially movable to said housing, each folding element comprising an angled folder bar between which a strand end is movable for folding portions of the strand end.

4,506,491

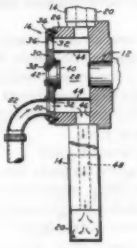
CONTAINER STERILIZATION APPARATUS AND METHOD

Richard L. Joosten, 6226 Carpathian Ct., West Bloomfield, Mich. 48033, and George A. Davis, Jr., 3224 Old Orchard, Brighton, Mich. 48116

Filed Apr. 16, 1982, Ser. No. 368,940

Int. Cl.³ B65B *43/08, 55/10*

U.S. Cl. 53—426 **4 Claims**



3. A method for sterilizing a rigid container prior to its being filled with a liquid, said method comprising the following steps:

(a) Slidably mounting a tubular, open-ended container on a mandrel having a longitudinal opening formed therethrough;

(b) Sealing the outer end of said container against said mandrel so as to be completely filled by said mandrel;

(c) Providing communication between a source of a sterilant in a fog state and said longitudinal opening of said mandrel, said sterilant being under substantially no pressure with no positive sterilant feeding means;

(d) Stripping said container from said mandrel, thereby creating a vacuum within the container without the use of a vacuum forming means and, thus, drawing said sterilant into the container and enhancing the covering of the container's interior surfaces with said sterilant; and

(e) Conveying said sterilized container through top folding, filling, heating and sealing stations.

4,506,492

APPARATUS AND METHOD FOR VOLUME FILLING OF STORAGE BOXES

Jerry L. Boyd, 2908 Caliente St., Bakersfield, Calif. 93306

Filed Sep. 29, 1982, Ser. No. 426,668

Int. Cl.³ B65B *1/06, 39/12, 57/06*

U.S. Cl. 53—473 **13 Claims**

1. In a method filling storage boxes with discrete articles such as lemons, at a fill station in which the lemons are delivered to an open side of a fill box at a selected level with the fill box in upper positions thereof; the steps of:

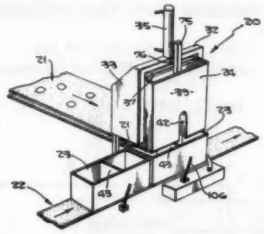
positioning a fill box at the fill station to receive lemons

through the open side at approximately the level of the bottom wall of the fill box;

positioning a storage box at the fill station below the fill box to telescopically receive the fill box as lemons collect therein;

incrementally lowering the fill box as lemons collect therein to continue to receive lemons at the selected level;

progressively closing the open side of said fill box during descent thereof to retain lemons therein;



stopping the descent of the fill box when it contains deposited lemons of a volume to approxiately fill the storage box;

opening the bottom wall to deposit and to distribute lemons in the storage box as the fill box ascends to its upper most position with the bottom wall at about said selected level;

closing the bottom wall above the top of the storage box;

and continuing the delivery of lemons into the now emptied fill box while a second storage box is being positioned beneath the fill box.

4,506,493

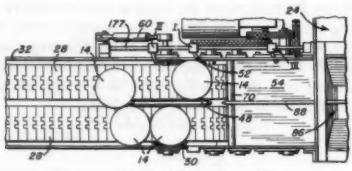
CASE PACKER

Richard Horton, Falmouth, Va., assignor to Duron, Inc., Beltsville, Md.

Filed Jul. 18, 1983, Ser. No. 514,521

Int. Cl.³ B65B *35/44, 57/10*

U.S. Cl. 53—499 **36 Claims**



1. A case packing system comprising a product introducing accumulator, first and second conveyor means, said accumulator including said first conveyor means having an upstream intake portion for receiving and moving multiple similar products, a downstream grouping area for receiving and grouping said products in multiple parallel rows, releasable abutment means positioned for retaining the grouped products for a lateral camming of following products from a completed row to an uncompleted row, means for selective releasing said abutment means and the grouped products retained thereby, said second conveyor providing a continuously unidirectional moving product support surface infeed means immediately downstream of said accumulator for receiving and propelling said grouped products as a discrete group in a continued downstream direction, a loading station downstream of said infeed means, said infeed means propelling the grouped products into said loading station, said loading station including a retractable support for the introduced products, a vertically shiftable table below said support, case conveyor means communicating with said locking station for the selective introduction of empty cases onto said table, means for retracting said support product support, upon the positioning of an empty case therebelow, for the discharge of grouped products thereinto, mean for discharging a loaded case from said loading station, and discharge conveyor means receiving a discharging case and moving said case outward relative to said loading station.

4,506,494

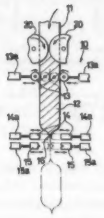
PACKED BAG CUTTER

Mamoru Shimoyama, 399-1, Kami-Kobayashi, and Isamu Hoshina, 1467-7, Nanjai, both of Tomioka, Gunma-ken, Japan

Filed Apr. 18, 1983, Ser. No. 486,100

Int. Cl.³ B65B *9/12, 51/14, 51/32*

U.S. Cl. 53—551 **1 Claim**



1. A packaging machine for intermittently feeding a tubular film material, filling it with a substance to be packaged and sub-dividing it into individual packages, which machine comprises:

(a) a pair of pinching rolls positioned opposite each other in the upper region of said machine and movable perpendicularly toward and away from said tubular film;

(b) a pair of heat-sealing means positioned opposite each other, substantially spaced from and beneath said pinching rolls and movable perpendicularly toward and away from said tubular film;

(c) a pair of cooling-cutting means positioned opposite each other, spaced from and beneath said heat-sealing means at a distance corresponding to the width of a sealed portion of tubular film and movable perpendicularly toward and away from said tubular film; and

(d) means for rotatingly driving said pinching rolls alternately, first a distance corresponding to the positioning of said tubular film in juxtaposition with said heat-sealing means, and then a distance corresponding to the width of the sealed portion of said tubular film.

4,506,495

MACHINE FOR PRODUCING BLISTER PACKAGES

Andrea Romagnoli, San Lazzaro di Savena, Italy, assignor to IMA-Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Jan. 21, 1982, Ser. No. 341,332

Claims priority, application Italy, Jan. 23, 1981, 3313 A/81

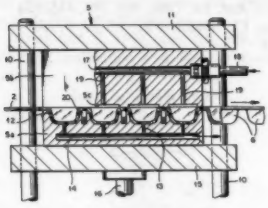
Int. Cl.³ B65B *47/08*

U.S. Cl. 53—559 **4 Claims**

1. In a machine for the production of blister packages, comprising a molding station with a reciprocating die holder adapted to press a preheated thermoplastic carrier strip through a die with at least one cavity onto an abutment plate having a channel opposite said cavity connected to a source of compressed air whereby blisters conforming to said cavity are produced in said carrier strip, a filling station downstream of said molding station having loading means for introducing goods to be packaged into the blisters of said carrier strip, a sealing station downstream of said filling station including a roller means for bonding an overlying cover strip to said carrier strip whereby the blisters thereof are hermetically closed against the atmosphere, and feed means for advancing said

carrier strip through said molding, filling and sealing station at a controlled speed,

the combination therewith of a die positioned on said die holder and provided with cavities having identical deep central portions surrounded by rim zones which are recessed away from said central portions outwardly, said rim zones being adjacent the path of said carrier strip, forming shoulders with said deep central portions and converging toward cavity bottoms remote from said rim zones that are vented to the atmosphere, said feed means



including a transport roller with peripheral indentations having mouths whose outlines substantially correspond to those of the rim zones of said cavities for closely surrounding base portions of blisters formed in said cavities, said roller means including a counterroller coacting with said transport roller for compressing said carrier and cover strips therebetween during positive entrainment of said carrier strip by said transport roller, said die being removable from said die holder for replacement by another die differing therefrom only in the configuration of its cavities at locations adjoining said rim zones.

4,506,496

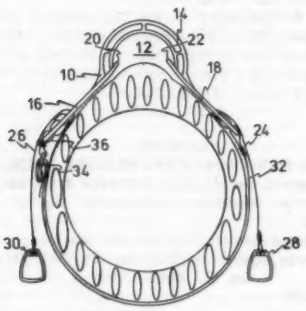
HAND GRIP AND STIRRUP SUPPORT DEVICE FOR BAREBACK HORSE RIDING

Darrel L. Olson, 2041 5th Ave., Greeley, Colo. 80631

Filed Feb. 6, 1984, Ser. No. 577,206

Int. Cl.³ B68B *1/02, 1/16*

U.S. Cl. 54—44 **10 Claims**



4. A one-piece preformed semi-flexible member for use in a handgrip and stirrup support device used for bareback riding of a horse by a bareback rider, the member being positioned in front of the bareback rider and over the horse and not beneath the rider to thereby permit the rider to ride bareback using the semi-flexible member as a handgrip and stirrup support, and not as a saddle; the semi-flexible member having a generally inverted V-shaped configuration having a semi-circular portion formed at the apex of the V-shape and having two downwardly extending, semi-flexible side members depending from opposite ends of said semi-circular portion, each semi-flexible side member having formed therein a plurality of slots for use in supporting the stirrups; the semi-circular portion having a predetermined size and diameter such that it can be gripped by the hand of the bareback rider.

4,506,497

METHOD AND DEVICE FOR METERING AND INJECTING SMALL AMOUNTS OF FLUID INTO THE SPLICING AIR OF A COMPRESSED GAS THREAD SPLICING DEVICE

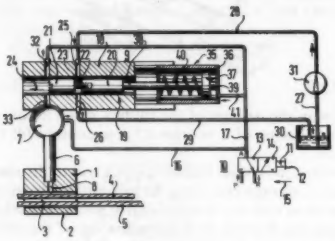
Helmut Feuerlohn, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,124

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1983, 3303419

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **9 Claims**



1. Method for metering and injecting small amounts of fluid into the splicing air of a splicing head of a compressed gas thread splicing device including a metering valve having a piston with a metering chamber formed therein, the metering chamber having a given volume determining the amount of fluid to be injected, the piston being slideable between a loading position and an injecting position of the metering chamber, a circulating fluid circuit connected to the piston, and a compressed gas circuit connected from the piston to the splicing head, which comprises connecting the metering chamber to the circulating fluid circuit in the loading position before splicing, moving the piston from the loading position to the injecting position, and subsequently bringing the metering chamber in contact with a compressed gas current in the compressed gas circuit flowing into the splicing head as splicing air at the moment the fluid is to be injected for splicing.

4,506,498

TEXTILE YARN SPINNING MACHINE WITH SUPPLY STRAND INTERRUPTION

Joseph T. Lamb, Concord, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Mar. 8, 1984, Ser. No. 587,396

Int. Cl.³ D01H *13/18*

U.S. Cl. 57—87 **12 Claims**

1. In the combination of a textile yarn spinning machine having a plurality of drafting units arranged in a series longitudinally of the spinning machine, a plurality of supply strand packages each normally delivering a corresponding supply strand to a corresponding drafting unit for producing a corresponding attenuated strand, means movable along the spinning machine and having detector means for monitoring production of attenuated strands and actuator means for responding to breakage of an attenuated strand, and strand interrupting means mounted on the spinning machine and selectively remotely actuable by the actuator means for interrupting feeding of the corresponding supply strand, an improvement in the strand interrupting means comprising:

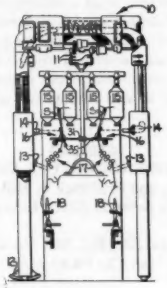
means defining an elongate strand guide located between

said supply strand packages and said drafting units and extending longitudinally past a plurality of successive drafting units,

means associated with said strand guide means and defining respective strand engaging surfaces correspondingly positioned for cooperating with the respective supply strands,

respective rotatably mounted collar means carried by said strand guide means, each including a strand engaging surface adapted to cooperate with the corresponding strand engaging surface associated with said strand guide means,

said collar means being normally oriented in a strand feeding



position with the strand engaging surface of the collar positioned in spaced apart relation from the cooperating strand engaging surface of said strand guide means for permitting the strand to pass freely therebetween, and said collar means being rotatably movable to a strand interrupting position in which the cooperating strand engaging surfaces are positioned in proximate relation for interrupting feeding of the supply strand passing therebetween, and

means carried by said collar means and cooperating with said actuator means for effecting movement of said collar means from said strand feeding position to said strand interrupting position in response to actuation by said actuator means.

4,506,499

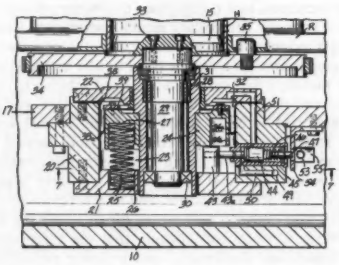
REEL SUPPORT SYSTEM

Donald A. Arpine, Hamden, Conn., assignor to The Watson Machine Company, Paterson, N.J.

Filed Jan. 3, 1984, Ser. No. 567,804

Int. Cl.³ D07B *7/06, 3/02*

U.S. Cl. 57—127.5 **4 Claims**



1. A system for rotatably supporting a reel on spaced apart pintles including a cradle having spaced apart walls, means defining a cylinder attached to at least one of said walls, said cylinder having a head, a piston having a head in said cylinder, said piston having walls defining a central bore and a peripheral wall, a pintle rotatably carried in said piston bore, a plurality of springs disposed between the walls defining said bore and said peripheral wall and biasing said piston toward an extended position to cause said pintle to engage a reel, a piston blocking member in said cylinder arranged to engage said piston and contact said cylinder head to prevent retraction of said pintle from a reel engaging position, a recess defined in said piston arranged to receive said blocking member and permit retraction of said piston when said blocking member is aligned with said recess, a fluid passage defined in said cylinder defining means to the head of said piston, fluid operated means mounted in said cylinder defining means and extending radially inwardly of the defined cylinder to said blocking member, said fluid operated means normally positioning said blocking member to prevent retraction of said piston and blocking said fluid passage, but being responsive to application of fluid pressure to said fluid passage to retract and permit fluid pressure to be applied to said piston head and move said blocking member to a position aligned with said recess.

4,506,500

STEEL CORD FOR REINFORCING A RUBBER STRUCTURE

Toshiaki Miyauchi, Taka, and Osamu Yoneda, Miki, both of Japan, assignors to Tokusen Kogyo Kabushiki Kaisha, Ono, Japan

Filed Apr. 7, 1983, Ser. No. 482,976

Claims priority, application Japan, Apr. 10, 1982, 57-60040; Apr. 30, 1982, 57-73544; Apr. 30, 1982, 57-73545

Int. Cl.³ D07B *1/06, 1/10*

U.S. Cl. 57—212 **5 Claims**

1. A steel cord for use as reinforcement for rubber structures, comprising a group of at least two wires of the same diameter intertwisted with each other, and a single wire intertwisted with said group, at least one of the twist direction and the twist pitch of the wires in said wire group being different from the corresponding twist direction and twist pitch of the single wire and wire group constituting said steel cord.

4,506,501

APPARATUS FOR REPAIRING CHAINS

Donald L. DeVall, 1082 Charles Ave.; Hu D. DeVall, Rte. 1, Box 362-A, and Clarence L. Tennant, 10 W. Fifth St., all of Morgantown, W. Va. 26505

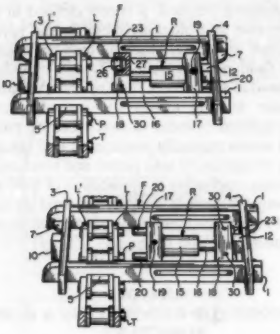
Filed Mar. 3, 1983, Ser. No. 471,863

Int. Cl.³ B21L *9/06*

U.S. Cl. 59—7 **12 Claims**

1. Apparatus for repairing a chain comprising a closed frame and hydraulic ram means located within the confines of said frame, said frame comprising a pair of spaced substantially parallel side rails, a front end member extending between and connected to one end of each of said side rails, and a rear end member extending between and connected to the other end of each of said side rails, said front and rear end members being substantially perpendicular to said substantially parallel side members, each of said side rails having a substantially U-shaped downwardly opening notch located between said front end member and said rear end member and adjacent to said front end member, anvil means on one face of said front end member and means connecting said front end member and said one end of said side rails so that said front end member may be reversed relative to said side rails to locate said anvil means within the confines of said frame when connecting chain sections and outside of the confines of said frame when discon-

necting chain sections, said ram means including a first head having means adapted to disconnect adjacent chain sections and a second head having means adapted to connect adjacent chain sections, one of said heads being in contact with said rear



end member when said ram means is located within the confines of said frame, whereby said downwardly opening notches in said side rails are adapted to lie over a section of chain to be worked on.

4,506,502

GAS TURBINE ENGINES

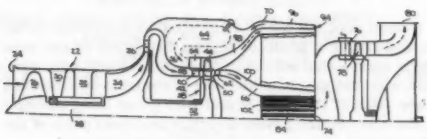
Jacov Shapiro, Jerusalem, Israel, assignor to Beit Shemesh Engines Ltd., Mobile Post Haela, Israel

Continuation of Ser. No. 222,945, Jan. 6, 1981,. This application Oct. 24, 1983, Ser. No. 544,803

Claims priority, application Israel, Jan. 20, 1980, 59170

Int. Cl.³ F02C *7/10*

U.S. Cl. 60—39.43 **4 Claims**



1. A compact, medium output gas turbine engine, comprising compressor means for compressing inlet air, said compressor means comprising at most three stages, including one centrifugal-type compressor stage, all mounted on a common shaft, at least the final one of said stages being constituted by an axial compressor portion of an integral axial compressor/axial compressor-turbine unit including a turbine disk carrying a row of blades in the form of two concentric arrays of blades the inner array of which constitutes said axial compressor portion and the outer array of which constitutes an axial compressor-turbine portion of said integral axial compressor/axial compressor-turbine unit, combustion means for burning fuel in mixture with the compressed air produced by said compressor means to provide hot gases, output-power generating means located downstream of said combustion means and operated responsive to said hot gases, first means for directing said hot gases from said combustion means to said axial compressor-turbine portion of said integral axial compressor/axial compressor-turbine unit for driving the same and therethrough said axial compressor portion of said integral axial compressor/axial compressor-turbine unit and therewith the preceding stage or stages of said compressor means, second means for directing the compressed air which is produced by said preceding stage or stages of said compressor means to said final stage thereof prior to mixing of that compressed air with fuel, for thereby cooling said row of blades of said integral axial compressor/axial compressor-turbine unit, both said first and second directing means being constructed and arranged for guiding the compressed air and said hot gases to flow solely in the interior of the engine and in the same direction through said integral axial compressor/axial compressor-turbine unit, and heat exchanger means intercalated between said integral axial compressor/axial compressor-turbine unit and said output-power generating means, said integral axial compressor/axial compressor-turbine unit being arranged for direct flow of said compressed air and said hot gases from the respective portions of said unit into said heat exchanger means, said heat exchanger means serving for transferring heat from said hot gases to said compressed air as said hot gases leave said axial compressor-turbine portion of said integral axial compressor/axial compressor-turbine unit and flow therefrom to said output-power generating means and as said compressed air leaves said axial compressor portion of said integral axial compressor/axial compressor-turbine unit and flows therefrom to said combustion means.

4,506,503

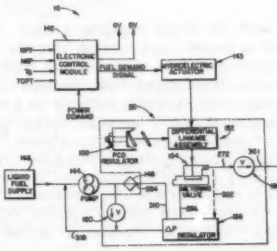
GAS TURBINE ENGINE FUEL CONTROLLER

Graham E. Ogborne, and Frederick J. Hill, both of San Diego, Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Apr. 30, 1982, Ser. No. 373,805

Int. Cl.³ F02C *9/28*

U.S. Cl. 60—39.281 **12 Claims**

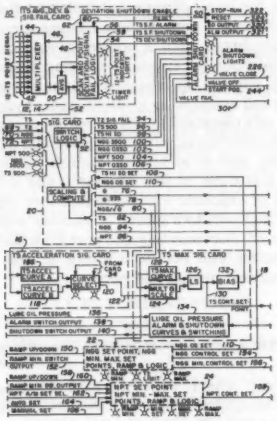


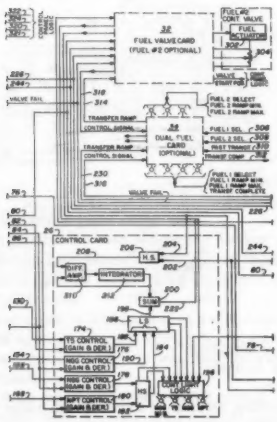
1. The combination of a gas turbine engine having a compressor and a combustor with means for controlling the flow of fuel to said combustor comprising: a metering valve means which includes a valve actuator means and means for sensing the discharge pressure of the compressor and for so controlling the operation of said valve actuator means as to provide first a lower and then a higher ratio of fuel flow through said metering valve to compressor discharge pressure as the compressor pressure increases, said compressor discharge pressure sensing and valve actuator controlling means comprising: a housing; a diaphragm mounted in said housing; an actuator mount carried by said diaphragm; an actuator fixed to and movable with said actuator mount; a first spring means fixed relative to said housing at one end thereof for biasing said diaphragm, said actuator mount, and said actuator toward one end of said housing, a plunger relatively movable relative to and carried by said actuator mount, a second spring means extending between said actuator mount and said plunger for similarly biasing said diaphragm, said actuator mount, and said actuator toward said one end of said housing, and means for so admitting compressor discharge air into said housing that the force exerted by said air biases said diaphragm, said actuator mount, and said actuator toward that end of the housing opposite said one end, said first and second spring means being so related that: (a) both act in parallel to bias said diaphragm, said actuator mount, and said actuator toward said one end of said housing until a specified compressor discharge pressure is reached and (b) only one of said springs is thus effective at compressor discharge pressures above said specified pressure.

4,506,504
ELECTRONIC FUEL CONTROL SYSTEM FOR GAS TURBINE

Charles F. Nick, Lufkin, Tex., assignor to Dresser Industries, Inc, Dallas, Tex.

Filed Mar. 31, 1983, Ser. No. 481,089
Int. Cl.[3] F02C 9/28
U.S. Cl. 60—39.281 5 Claims





1. An electronic engine control for operating a fuel valve of a gas turbine, comprising:

means for monitoring a plurality of parameters for said gas turbine to produce a plurality of parameter signals,

means for generating a setpoint signal for each of said parameter signals,

means for comparing each of said parameter signals with the respective setpoint signals to produce a control signal,

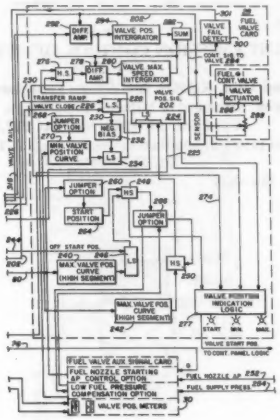
means connected to receive said control signal and at least one alternate condition control signal for amplitude selecting one of said control signals,

means for integrating said selected control signal to produce an integrated control signal,

a summation circuit having a first input connected to receive said integrated control signal and produce a fuel valve control signal for setting the position of said fuel valve,

means for monitoring said fuel valve position to produce a valve position signal,

a differential amplifier having the first input thereof connected to receive said integrated control signal and the second input thereof connected to receive said valve position signal, said amplifier producing a differential output signal,



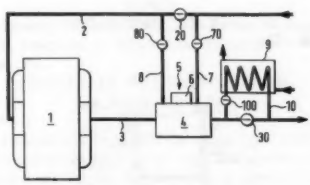
means for integrating said differential output signal and supplying said integrated differential output signal to the second input of said summation circuit, and

means connected to receive said differential output signal for generating a failure signal when said differential output signal has been offset from a set amplitude for more than a predetermined time.

4,506,505
DIESEL INTERNAL COMBUSTION ENGINE WITH SOOT BURN-OFF DEVICE

Hans-Harald Melzer, Neufahrn, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 438,985
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144349
Int. Cl.[3] F01N 3/02
U.S. Cl. 60—278 3 Claims



1. A self-igniting, air-compressing injection internal combustion engine, with an intake and an exhaust with a soot filter having a controllable soot-burning device comprising a burner,

a fresh air line equipped with a first control element for supplying combustion air from the intake to the burner

an exhaust return line means connected to the soot filter and controllable by a second control element for transmitting exhaust to the intake

further comprising

a third control element disposed in the intake downstream from the input to the fresh air line,

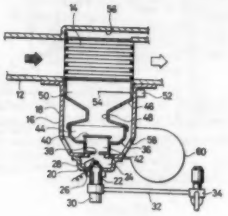
the exhaust return line being connected to provide input to the intake downstream of the third control element, and control means for controlling the first, second and third control elements of the intake, the fresh air line, and the exhaust return line to actuate the soot-burning device as a flame starter when starting the internal combustion engine.

4,506,506

EXHAUST EMISSION CONTROL DEVICE FOR DIESEL ENGINE

Toshifumi Usui, Katsuta, and Syozo Yanagisawa, Toukai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,817
Claims priority, application Japan, Aug. 2, 1982, 57-133690
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—303 **2 Claims**



1. An exhaust emission control device for Diesel engines comprising:

(a) an exhaust pipe for introducing the exhaust gas from a Diesel engine to the outside;

(b) a trap disposed in said exhaust pipe for collecting particulates in the exhaust gas;

(c) a burner disposed outside said exhaust pipe; and

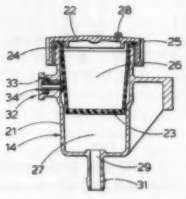
(d) a combustion gas passage for introducing the combustion gas from said burner to the outer periphery of said trap to superheat said trap while isolating the combustion gas from the exhaust gas in said exhaust pipe.

4,506,507

RESERVOIRS FOR LIQUID PRESSURE CONTROL SYSTEMS

Maurice J. Wimbush, Leamington Spa, England, assignor to Automotive Products plc, Leamington Spa, England

Continuation of Ser. No. 338,165, Jan. 8, 1982, abandoned. This application Apr. 11, 1984, Ser. No. 599,248
Claims priority, application United Kingdom, Jan. 21, 1981, 8101849
Int. Cl.³ B60T *11/26*
U.S. Cl. 60—584 **4 Claims**



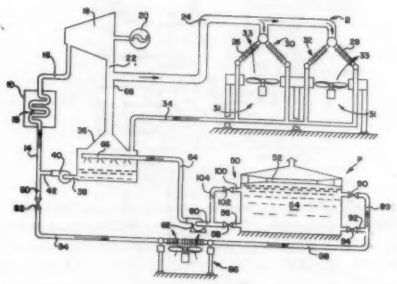
1. A hydraulic fluid reservoir for a hydraulic control system, said system comprising a master cylinder and a remote slave cylinder connected to the master cylinder by a conduit, said reservoir being connected to said master cylinder and comprising a body having a mouth, a detachable cap mounted on the mouth of the body and removable for replenishing the reservoir with hydraulic fluid through said mouth, a flexible diaphragm secured in position by said cap and also removable for replenishing the reservoir with hydraulic fluid, said diaphragm dividing the reservoir into two separate and non-communicating chambers, one of said chambers being an air chamber below said cap vented to atmosphere through an aperture in the cap and the other of said chambers being a chamber below said diaphragm for containing hydraulic fluid and connectable to the master cylinder, an inlet port defined in a wall of the reservoir body for initial charging of hydraulic fluid into the other of said chambers without necessitating the removal of the cap and diaphragm, and a non-removable closure plug located in the inlet port for subsequent sealing thereof after the initial charging, wherein the inlet port and the closure plug are so constructed and arranged as to allow excess hydraulic fluid in the other of said chambers to exit therefrom past the closure plug when a predetermined pressure differential exists across the closure plug and as to prevent ambient air from being introduced to said other of said chambers, and wherein said initial charging of hydraulic fluid is effected through said port by connecting said port to a source of vacuum with said closure plug removed, disconnecting said port from said source of vacuum, connecting said port to a source of said hydraulic fluid and placing said plug in said port.

4,506,508

APPARATUS AND METHOD FOR CONDENSING STEAM

Don H. Coers, and John T. Crawford, both of Naperville, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 25, 1983, Ser. No. 478,655
Int. Cl.³ F01K *9/00*
U.S. Cl. 60—652 **16 Claims**



10. Apparatus comprising:

a steam driven turbine;

a cooling tower;

means for delivering an exhaust steam stream under vacuum from the turbine to the cooling tower;

a hot reservoir for cooling water when hot;

a cold reservoir for cooling water when cold;

means for withdrawing cold cooling water from the cold reservoir and feeding cold cooling water to the exhaust steam to condense a portion of the steam when the cooling capacity of the cooling tower is inadequate to cool all the exhaust steam;

means for withdrawing hot condensed water from the exhaust steam stream and feeding it to the hot reservoir;

means for withdrawing hot cooling water from the hot reservoir when the temperature of the exhaust steam stream decreases to below the temperature of the hot cooling water in the hot reservoir and delivering the hot cooling water to the exhaust steam stream under vacuum to thereby cool the hot cooling water; and

means for delivering the resulting cold cooling water to the cold reservoir.

14. Apparatus comprising:

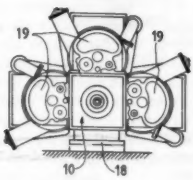
a base cooling means;
means for delivering an exhaust steam stream under vacuum to the base cooling means;
a hot reservoir for cooling water when hot;
a cold reservoir for cooling water when cold;
means for withdrawing cold cooling water from the cold reservoir and feeding cold cooling water to the exhaust steam to condense a portion of the steam when the cooling capacity of the base cooling means is inadequate to cool all the exhaust steam;
means for withdrawing hot condensed water from the exhaust steam stream and feeding it to the hot reservoir;
means for withdrawing hot cooling water from the hot reservoir when the temperature of the exhaust steam stream decreases to below the temperature of the hot cooling water in the hot reservoir and delivering the hot cooling water to the exhaust steam stream under vacuum to thereby cool the hot cooling water; and
means for delivering the resulting cold cooling water to the cold reservoir.

4,506,509

GAS TURBINE PLANT

Sven-Olof Kronogard, deceased, late of Lomma, Sweden, and by Allan Lindén, administrator, Gothenburg, Sweden, assignors to United Turbine AB & Co., KG, Sweden

Filed Aug. 25, 1983, Ser. No. 526,329
Claims priority, application Sweden, Sep. 8, 1982, 8205099
Int. Cl.³ F01B *21/04*
U.S. Cl. 60—720 **5 Claims**



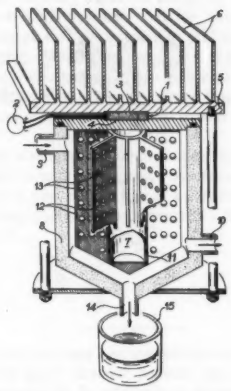
1. A gas turbine plant comprising:
a base member formed like a box having two square end walls and four like side walls joined thereto,
(A) bearing means for carrying an output shaft centrally in said end walls,
(B) a main gear wheel formed as a clutch and disengageably fitted upon said output shaft, said main gear wheel having a diameter only slightly less than the dimensions of said end walls,
(C) at least one gas turbine unit for mounting upon said base member with its rotor shaft parallel to said output shaft and including:
(1) a housing component having a downwardly open base portion defined by a seating mating with either of the side walls of said base member,
(2) a rotor shaft carrying a compressor rotor and a turbine rotor as well as a driving gear wheel, said rotor shaft being at least partly built into said housing component,
(3) a lay shaft journalled in said housing component and carrying first and second gear wheels, of which said first wheel is in meshing engagement with said driving gear wheel upon said rotor shaft, and said second gear wheel having a radius making it project with a marginal portion beyond said seating, whereby, when said base portion is mounted upon either of said side walls of said base member it will mesh with the main gear wheel upon said output shaft,
(D) said base portion carrying said housing component and associated parts cantileverwise from said base member.

4,506,510

APPARATUS FOR CONTINUOUSLY METERING VAPORS CONTAINED IN THE ATMOSPHERE

Michel Tircot, Leuville sur Orge, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 23, 1983, Ser. No. 497,187
Claims priority, application France, Jun. 10, 1982, 82 10123
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **3 Claims**



1. An apparatus for the continuous metering of the vapours contained in the atmosphere of the type in which said atmosphere is circulated in contact with a cold source, leading to the condensation of the vapours, wherein it comprises a thermoelectric module subject to the Peltier effect, which is supplied with electric power and whose hot face is in contact with a heat-dissipating radiator and whose cold face is in contact with a thermally insulated condensation chamber in which circulates the atmosphere charged with the vapours to be condensed, said chamber having a conductive metal structure provided with perforated ribs, the flow of the atmosphere and the temperature being permanently controlled at values such that the condensed vapour remains in the liquid state, the liquid condensate obtained flowing by gravity into the lower part of the chamber which, for this purpose, has a liquid phase discharge port.

4,506,511

THERMOELECTRIC AIR COOLER FOR THERAPEUTIC TENTS

L. Robert Cameto, Oakland, Calif., and Robert M. Jepson, Lake Villa, Ill., assignors to Misto$_2$Gen Equipment Corporation, Lancaster, Pa.

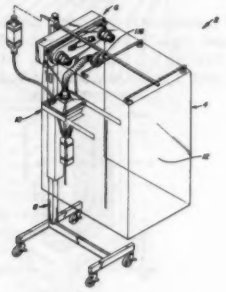
Filed Oct. 13, 1983, Ser. No. 541,408
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **18 Claims**

1. A thermoelectric air cooler for use in combination with a therapeutic tent of the type including a tent enclosure defining a conditioned air region for creating a controlled ambient atmosphere for a patient, said thermoelectric air cooler comprising:
a main housing;
a thermoelectric module mounted within the housing and having hot and cold junction surfaces;
a generally planar cold surface at an external wall of said main housing thermally coupled to said cold junction surface;
a cooling heat exchanger thermally coupled to said cold surface;
a cool air enclosure having a conditioned air intake and a conditioned air exhaust and defining a cool air path from

said conditioned air intake, past said cooling heat exchanger and to said conditioned air exhaust, said cool air enclosure and said cooling heat exchanger arranged and adapted so said cool air path is physically isolated from and external to said main housing;

passageways fluidly connecting the conditioned air region with said conditioned air intake and exhaust;

means for removably mounting said cooling heat exchanger and said cool air enclosure to said main housing so said



cooling heat exchanger and said cool air enclosure can be removed and cleaned separate from said main housing thereby aiding sterilization of the components of the air cooler contacting air from said conditioned air region;

a fan adapted for forcing air along said cool air path so air from the conditioned air region is cooled as it passes said cooling heat exchanger;

a hot air heat exchanger thermally coupled to said hot junction surface; and

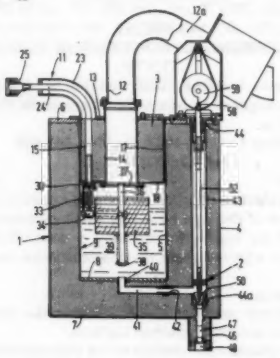
means for removing heat from said hot air heat exchanger.

4,506,512

CRYOGENIC LIQUID DISTRIBUTING DEVICE

Pierre Delacour, Sassenage, and Roger Prost, Saint-Egreve, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 10, 1984, Ser. No. 569,587
Claims priority, application France, Jan. 12, 1983, 83 00372
Int. Cl.³ F17C *13/02*
U.S. Cl. 62—49 **7 Claims**



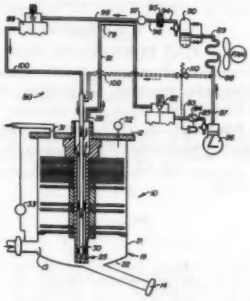
1. A cryogenic liquid distributing device comprising a reservoir which has two spaced-apart walls constituting a double wall which highly insulates the reservoir, said two walls defining an interstitial insulation space in which insulating particles are disposed and constituting an inner reservoir body and an outer case, an inlet pipe and a lower drawing-off pipe both opening into said reservoir body, said drawing-off pipe having a drawing-off valve in said interstitial space, and means for regulating the utilization flow of said liquid including a control rod which extends in said interstitial insulation space and operates said drawing-off valve, said outer case defining a fluidtight passage through which said control rod extends, said control rod extending beside said reservoir body on the side of said reservoir body and between said reservoir body and the portion of said case which is closest to said reservoir body on said one side of said reservoir body.

4,506,513

COLD TRAP

John K. Max, 1420 Healdsburg Ave., Healdsburg, Calif. 95448

Filed Jun. 17, 1983, Ser. No. 505,524
Int. Cl.³ B01D *8/00*
U.S. Cl. 62—55.5 **17 Claims**



1. A cold trap system comprising:

a refrigerant source including a coolant supply line and a vapor return line;

a generally cylindrical tank defining an internal chamber, a drain, at least one vapor inlet, and an open top;

a cover sealable to the top of said tank and having an expansion chamber port and a gas outlet;

a tubular expansion chamber having a top end seatable in said expansion chamber port and extending from said cover for the length of said internal chamber to a closed bottom end, the top end defining a coolant supply port fluidly connected to said coolant supply line and a coolant return port fluidly connected to said vapor return line;

a hollow feed tube disposed inside said expansion chamber and forming a passage from said coolant supply port to a feed tube outlet hole near the bottom of the expansion chamber; and

a plurality of axially spaced apart perforated planar disk shaped baffles having center holes sized to fit around and being mounted to said tubular expansion chamber and having outer perimeters sized to fit in said internal chamber.

4,506,514

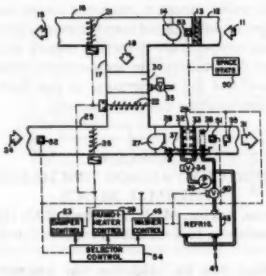
CONTROLLING ENERGY IN AN AIR-CONDITIONING SYSTEM

Roger H. Lamar, and Robert A. Davis, both of Winston-Salem, N.C., assignors to The Bahnson Company, Winston-Salem, N.C.

Filed Apr. 30, 1984, Ser. No. 605,684
Int. Cl.³ B01F *3/02*
U.S. Cl. 62—91 **17 Claims**

1. In an air conditioning system to maintain a selected temperature and humidity in a work space,

said system having an air washer with an inlet connected to recirculated-air and outside-air ducts and an outlet connected to work-space inlets, damper means in said ducts having a controller to proportion the recirculated and outside air admitted to said washer, throttling means to modulate the flow of water through said washer; cooling means coupled to said washer to modulate the cooling effect of said washer; and means responsive to the dew-point temperature of the air passing through said washer outlet and responsive to the humidity and the temperature in said work space transmitting input signals to said damper control, to said throttling means and to said cool-



ing means to modulate the temperature and the moisture content of the washer air issuing from said outlet; the improvement comprising

sensors to generate enthalpy signals indicating the levels of enthalpy of the recirculated air, the outside air, and the washer air issuing from said outlet respectively; and

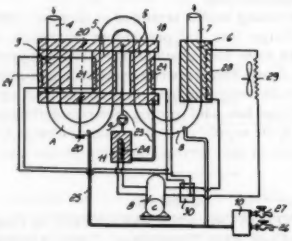
a selector control receiving said enthalpy signals and operable to selectively interrupt the transmission of said input signals to said damper control and to said cooling means and selectively operable to transmit an auxiliary signal to said damper controller to control said dampers when its input signal is interrupted.

4,506,515

REFRIGERATING-CYCLE HEAT PUMP PURIFYING SYSTEM FOR CONDENSABLE GASEOUS MIXTURES OF DRY-CLEANING PLANTS

Orlando Bedolo, Via Turazza, 2, 35100 Padova, Italy

Filed Aug. 2, 1982, Ser. No. 403,984
Claims priority, application Italy, Aug. 10, 1981, 41628 A/81
Int. Cl.³ F25D *17/06*; F25B *21/06*
U.S. Cl. 62—93 **5 Claims**



1. A refrigerating-cycle heat pump purifying device for condensable gaseous mixtures circulating in a dry cleaning plant, comprising:

a pipe coil, in which said gaseous mixture can circulate;

a series of enveloping chambers, in which portions of said pipe coil are housed;

a refrigerating unit including a compressor,

a condenser and an evaporator;

a main duct serially connected said condenser, said evaporator and said compressor for circulating a refrigerating fluid;

a tank for housing said evaporator;

a delivery and return piping for connecting a high thermal capacity fluid in said tank with said enveloping chambers;

a pump on said delivery pipe, for pumping the fluid from said tank into said chambers and for having said fluid returned through said return pipe to said tank;

a heat exchanging chamber housing the end portion of said pipe coil and said condenser, in which chamber said high thermal capacity fluid is contained, said fluid being heated by said condenser and yielding heat to said end portion of said coil;

defrosting coils arranged and immersed in said high thermal capacity fluid in said enveloping chambers;

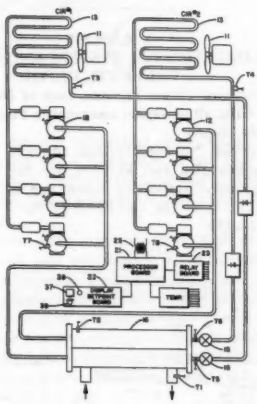
and an additional duct connecting in a parallel arrangement said defrosting coils with said main duct through a commuting valve.

4,506,516

REFRIGERATION UNIT COMPRESSOR CONTROL

Richard G. Lord, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,335
Int. Cl.³ F25B *5/00*
U.S. Cl. 62—117 **1 Claim**



1. A method of operating a refrigeration system including at least two refrigerant loops having a plurality of compressors in each loop for compressing gaseous refrigerant supplied to the compressors from an evaporator chiller comprising:

electrically connecting the outputs of a microprocessor control to the input controls of the compressors;

programming two complete reversed loading sequences for the compressors into said microprocessor;

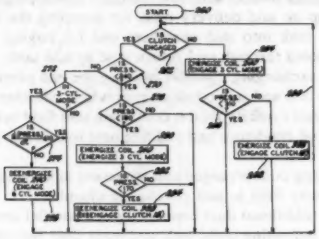
selecting randomly one sequence to load the compressors to full load; and

selecting randomly, when the compressors have reached full load, one sequence to unload the compressors.

4,506,517
AIR CONDITIONING COMPRESSOR UNLOADING CONTROL SYSTEM

Richard T. Pandzik, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 9, 1982, Ser. No. 406,127
Int. Cl.³ F25B *7/00*; F04B *49/00*
U.S. Cl. 62—175 **3 Claims**

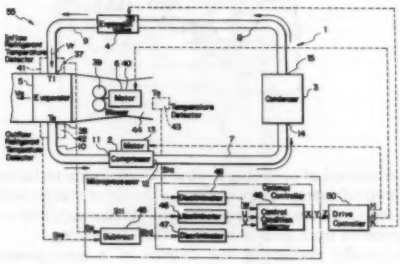


1. In an air conditioning system having a compressor which is driven through a selectively engageable clutch and has at least one cylinder which is selectively unloadable, a cylinder unloading control system comprising pressure sensing means for sensing refrigerant pressure in the system, clutch engagement sensing means for sensing clutch engagement and cylinder unloading control means to effect unloading of said one cylinder when the compressor is started with engagement of the clutch regardless of the system pressure and to thereafter maintain unloading thereof so long as the system pressure (1) exceeds a first predetermined value and (2) does not decrease with time above a predetermined rate and (3) the clutch remains engaged, and to effect loading of said one cylinder when either the system pressure falls below a second predetermined value substantially less than said first predetermined value or the clutch is disengaged.

4,506,518
COOLING CONTROL SYSTEM AND EXPANSION VALVE THEREFOR

Seimi Yoshikawa; Hideo Yamada, both of Ohgaki, and Yoichi Okubo, Gifu, all of Japan, assignors to Pacific Industrial Co. Ltd., Giln, Japan

Division of Ser. No. 388,171, Jun. 14, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 605,487
Claims priority, application Japan, Jun. 17, 1981, 56-94208
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—180 **23 Claims**



1. A cooling control system comprising a cooling apparatus having a refrigerant compressor, a vapor condenser to condense refrigerant pressurized by the compressor, an expansion valve means for controlling flow rate of the refrigerant and for expanding the refrigerant condensed by the condenser under pressure, an evaporator for evaporating the expanded refrigerant, and a blower for directing fluid to be cooled to the evaporator,

a first temperature detection means for detecting a temperature of the fluid to be cooled,

a second temperature detection means for detecting a temperature of the refrigerant which is introduced into the evaporator,

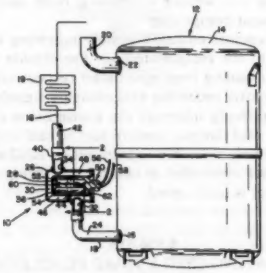
a detection means for detecting a temperature difference between a temperature of the refrigerant discharged from the evaporator and the temperature of the refrigerant introduced into the evaporator, and

a control means for controlling operations of the compressor as well as the blower and for controlling an opening of the expansion valve means in response to the temperature of the refrigerant introduced into the evaporator detected by the second temperature detection means, the temperature difference detected by the temperature difference detection means, and the temperature of the fluid detected by the first temperature detection means.

4,506,519
HERMETIC COMPRESSOR DISCHARGE LINE THERMAL BLOCK

Robert L. Morse, Adrian, Mich., and Russell M. Hagan, Vernon Hills, Ill., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 24, 1983, Ser. No. 526,108
Int. Cl.³ F25B *1/00*
U.S. Cl. 62—190 **21 Claims**



1. A refrigeration system, comprising:

a compressor having means for pumping pressurized refrigerant out a discharge outlet thereof,

a discharge line connected to said discharge outlet of said compressor for delivering pressurized refrigerant from said compressor, and

a thermal blocking means arranged in thermal contact with said discharge line for preventing migration of liquid refrigerant from said condenser to said compressor, said blocking means being operative when said compressor is inactive and comprising heating means to heat a portion of said discharge line, said heating means including means for decreasing the supply of heat to said discharge line as the temperature of said thermal blocking means increases.

4,506,520
VAPOR GENERATING AND RECOVERY APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

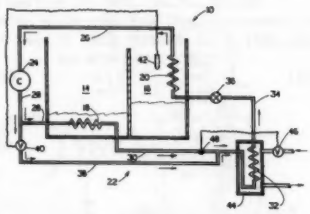
Filed Aug. 1, 1983, Ser. No. 519,518
Int. Cl.³ F25B *41/00*; B01D *3/42*
U.S. Cl. 62—196.4 **13 Claims**

1. A vapor generating and recovery apparatus for vaporizing a liquid and condensing the vaporized liquid comprising:

a housing including at least one chamber therein for vaporiz-

ing a liquid and recovering said vapor in the form of a liquid; and,

a variable heat system including main heat emitting means disposed in heat emitting relationship with the liquid in said chamber, main heat absorbing means disposed in heat absorbing relationship with vaporized liquid in said chamber, a compressor for compressing a heat transfer fluid, said compressor being in fluid communication on its discharge side with said main heat emitting means and on its inlet side with the main heat absorbing means, a complimentary heat emitting means in fluid communication with



said main heat emitting means and the main heat absorbing means, and by-pass means in fluid communication with the discharge side of said compressor upstream of said main heat emitting means and in fluid communication with the complimentary heat emitting means downstream of the main heat emitting means for continuously shunting a selected amount of less than all of the heat transfer fluid around said main heat emitting means so that the non-selected amount of the heat transfer fluid will continue to pass through the main heat emitting means concurrently, and remixing the shunted heat transfer fluid with the heat transfer fluid leaving the main heat emitting means.

4,506,521

COOLING AND HEATING DEVICE

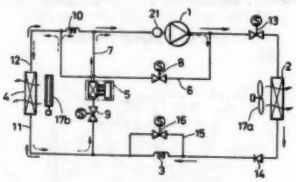
Tadashi Asano; Tadashi Suzuki, and Tadatsugu Fujii, all of Gifu, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,659

Claims priority, application Japan, Dec. 22, 1981, 56-207510; Dec. 22, 1981, 56-207511; Dec. 24, 1981, 56-215687

Int. Cl.³ F25B *41/00, 27/02*

U.S. Cl. 62—238.7 **23 Claims**



1. A cooling and heating device, comprising:

(a) a cooling circuit including a series circuit of an outdoor heat exchanger, resistance means and an indoor heat exchanger;

(b) a compressor interposed between said indoor heat exchanger and said outdoor heat exchanger in said cooling circuit, for circulating refrigerant in said cooling circuit and in a heating circuit, said heating circuit comprising a cycle circuit branching from between a discharge outlet side of said compressor and said outdoor heat exchanger in said cooling circuit and returning to a suction inlet side of said compressor through said indoor heat exchanger;

(c) a refrigerant heater in said heating circuit bridging a connecting point between said indoor heat exchanger and said compressor and a connecting point between said resistance means and said indoor heat exchanger,

refrigerant at high temperature heated by said refrigerant heater, during a heating operation, being circulated in a heating cycle circuit from said compressor, flowing in said indoor heat exchanger in a direction opposite that in which the refrigerant flows in said cooling circuit, radiating heat, entering said refrigerant heater where said refrigerant is again heated, and returning to said compressor; and

first valve means, in said heating circuit, for preventing refrigerant from entering said refrigerant heater during a cooling operation.

4,506,522

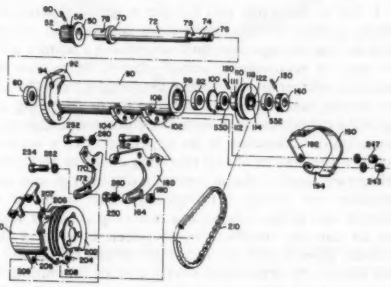
HELICOPTER AIR CONDITIONER COMPRESSOR DRIVING AND MOUNTING APPARATUS

Gary Swaney, St. Petersburg, and Donald E. Sells, Largo, both of Fla., assignors to Aero Engineering Corporation of Clearwater, Clearwater, Fla.

Filed Dec. 19, 1983, Ser. No. 562,536

Int. Cl.³ B60H *3/04*

U.S. Cl. 62—243 **12 Claims**



1. An air conditioner refrigerant compressor driving and mounting apparatus for a helicopter of the type having an engine power output shaft and take-off pad comprising:

(a) a compressor drive assembly housing supported by said take-off pad;

(b) a compressor drive assembly drive shaft extending linearly through said compressor drive assembly housing from said engine power output shaft;

(c) connecting means for connecting said compressor drive assembly drive shaft with said engine power output shaft to rotate said compressor drive assembly drive shaft;

(d) bearing means providing for free rotation of said compressor drive assembly drive shaft within said compressor drive assembly housing;

(e) a compressor drive assembly drive shaft pulley attached to said compressor drive assembly drive shaft;

(f) bracket means for mounting an air conditioner refrigerant compressor on an outer surface of said compressor drive assembly housing such that a compressor drive shaft for driving said compressor is generally parallel with said compressor drive assembly drive shaft;

(g) a compressor pulley attached to said compressor drive shaft and generally aligned with said compressor drive assembly drive shaft pulley; and

(h) belt drive means connecting said compressor drive assembly drive shaft pulley with said compressor pulley to drive said compressor.

4,506,523

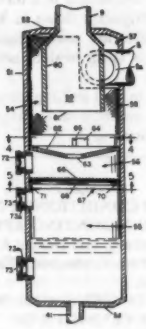
OIL SEPARATOR UNIT

Leonard J. DiCarlo, Maryland Heights; Roland A. Ares, St. Charles, and Robert O. Norton, Chesterfield, all of Mo., assignors to Hussmann Corporation, Bridgeton, Mo.

Division of Ser. No. 442,967, Nov. 19, 1982, Pat. No. 4,478,050. This application Apr. 12, 1984, Ser. No. 599,468

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—470 **5 Claims**



1. An oil separator unit for use in an oil separation and oil return system for the compressor means of a refrigeration system; said oil separator unit comprising a unitary oil separator and oil accumulator vessel adapted to receive the high pressure refrigerant-oil mixture discharged from the compressor means; said vessel including an upper receiving chamber having a cylindrical wall with a compressor discharge conduit tangentially connected in its upper portion, a separated oil outlet at the bottom of said receiving chamber and a separated refrigerant intake column centrally disposed in said receiving chamber and having a refrigerant vapor outlet at the top thereof, said intake column and receiving chamber wall defining an annular chamber therebetween to receive the high pressure gaseous mixture and effect oil and refrigerant separation therein by centrifugal vortex action, foraminous oil collecting and separating means lining the cylindrical wall of said annular chamber in the vortex flow path of said gaseous mixture, and vapor deflector means adjacent to said separated oil outlet and in open communication with said annular chamber and refrigerant intake chamber for regenerating vortex separating action in said vapor in the final separation zone of said receiving chamber.

4,506,524

ABSORPTION TYPE HEAT TRANSFER SYSTEM FUNCTIONING AS A TEMPERATURE PRESSURE POTENTIAL AMPLIFIER

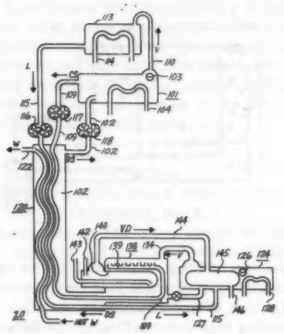
Ralph C. Schlichtig, 11212 3rd Ave. South, Seattle, Wash. 98168

Filed Aug. 15, 1983, Ser. No. 523,185

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—476 **26 Claims**

1. An absorption type heat transfer system employing as working fluids a low temperature boiling point stable refrigerant as solute and a stable solvent of high boiling point, with a solution of the solute and solvent functioning as an absorbent, in which the mutual solubility of the working fluids is much greater at high temperatures than at low temperatures as indicated by the slope of the log vapor pressure versus temperature curve of the solution of solute and solvent being less than the slope of the log vapor pressure versus temperature curve of the pure solute, the system comprising: a condenser; separator means operating at a predetermined temperature for evaporating a portion of the solute to a vapor and for separating such portion of the solute from a solution of the working fluids; means for maintaining said separator means at the predetermined temperature; means for delivering the separated solute vapor to said condenser for condensing the solute vapor to a liquid, leaving within said separator means a remaining concentrated solution of the working fluids, thus establishing a temperature and/or vapor pressure potential difference between the condensed solute and the remaining concentrated solution of the working fluids; heat exchange means for raising the temperature of the said remaining concentrated solution, thus amplifying the temperature and/or vapor pressure potential difference between the condensed solute and said remaining concentrated solution; boiler means disposed for receiving



and evaporating condensed solute; an absorber disposed for receiving the heated remaining concentrated solution and for absorbing the solute vapor from said boiler means into solution and thereby releasing heat of absorption and diluting the solution; means for maintaining said absorber at a higher temperature than said separator means; means for recovering the amplified temperature and/or vapor pressure potential difference generated between said absorber and said boiler means; and means for returning the diluted solution within said absorber through said heat exchange means to said separator means thus cooling such diluted solution before returning to said separator means.

4,506,525

KNITTING MACHINE

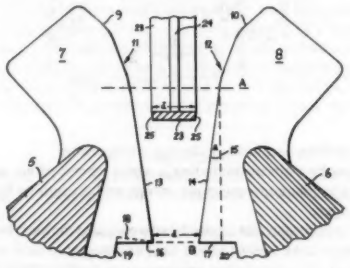
Frank Robinson, Breaston, and Max W. Betts, Falmouth, both of England, assignors to Courtaulds PLC, London, England

Filed Nov. 22, 1983, Ser. No. 554,455

Claims priority, application United Kingdom, Nov. 22, 1982, 8233271

Int. Cl.³ D04B *15/06*

U.S. Cl. 66—109 **7 Claims**



1. A flat V-bed knitting machine having two needle beds,

a presser foot assembly, in which a presser foot is resiliently urged downwards between the needle beds, and

knocking over bits associated with each needle bed, at least some of said knocking over bits having lower portions with inner edges which have a smooth profile and are inwardly inclined, in the downward direction, with respect to the knocking over bits of the opposite needle bed.

4,506,526

APPARATUS FOR TREATING WEBS OF MATERIAL

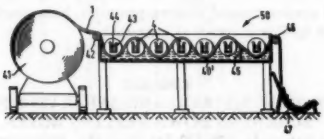
Johannes Kutz, Tönisvorst; Dieter Itgenhorst, Krefeld, and Julius Kohnen, Tönisvorst, all of Fed. Rep. of Germany, assignors to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,947

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237507; Dec. 24, 1982, 3248048; Jul. 6, 1983, 3324352

Int. Cl.³ D06B *3/12*

U.S. Cl. 68—15 **11 Claims**



1. Apparatus for treating webs of material comprising:

a trough, which contains liquid, having a bottom, sides and open top such that the liquid is under atmospheric pressure;

several rotatable bouyant rolls, each comprising a closed bouyant hollow body, arranged in said trough parallel to each other and adjacent to each other;

means guiding said rolls in the horizontal plane but allowing them to float freely in the vertical direction without making contact, said bouyant rolls arranged floating in said liquid such that all are substantially in the same horizontal plane;

means conducting the web of material along the successive bouyant rolls looped around said rolls in zig-zag fashion; and

nozzles located below the liquid level and aimed upward into the corners between upward running parts of the web material and said rolls, said nozzles adapted to have a fluid medium blown therethrough under pressure into the liquid.

4,506,527

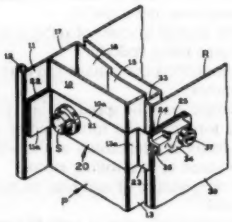
VEHICLE DOOR LOCK ASSEMBLY

Milton D. Grill, 9815 NW. 65th Ct., Tamarac, Fla. 33321

Filed Apr. 4, 1983, Ser. No. 481,803

Int. Cl.³ E05B *73/00;* **E05C** *19/18*

U.S. Cl. 70—14 **9 Claims**



1. A unitary door lock assembly for removable attachment to an automotive vehicle having a body with a door opening, a front-hinged door for closing said door opening, an upwardly extending door post at the rear of said door opening, and a striker extending forward from said door post for coaction with a latch on said door when the latter is closed, said lock assembly comprising:

a thin mounting plate shaped and dimensioned to fit in front of the door post and pass laterally outward behind the rear edge of the door, said mounting plate having an opening therein for passing said striker when the mounting plate is placed against the front of the door post, said mounting plate having an outer wall segment positioned to extend rearward from said door post across the outside of the car behind said door;

and a lock on said outer wall segment of the mounting plate having a locking element which is extensible forwardly along the outside of said door to lock the latter closed and is retractable rearwardly to a position completely behind the rear edge of said door to permit the latter to be opened and closed.

4,506,528

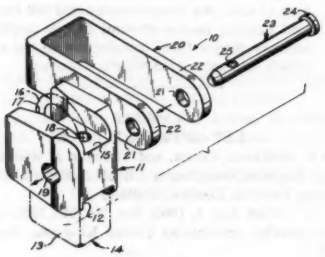
SECURITY DEVICE FOR PADLOCKS

David S. Eberly, 5407 Touraine Dr., Tallahassee, Fla. 32308

Filed Jun. 10, 1983, Ser. No. 503,029

Int. Cl.³ E05B *73/00, 67/38*

U.S. Cl. 70—18 **1 Claim**



1. A device for protectively locking one member against movement relative to a second member by means of a padlock having a U-shaped hasp and a body, comprising a solid metal retainer carried by one member and having recesses in opposite faces and one intervening face thereof and passages extending therethrough and intersecting within the retainer, a second retainer carried by the other member, and a pin connecting said retainers and extending into a passage of said first retainer, said pin having a transverse opening located at the intersection of said passages of said first retainer to receive a portion of said padlock hasp extending into the passage of said first retainer which intersects said pin, the remaining portions of said hasp and at least part of said padlock body fitting in the recesses of said first retainer when said hasp portion and pin intersect.

4,506,529

STANDPIPE SECURITY APPARATUS

Josef Armbruster, Jr., 3927 York BL, Los Angeles, Calif. 90065, and Toby Argandona, 21221 Running Branch Rd., Diamond Bar, Calif. 91765

Filed Sep. 30, 1982, Ser. No. 429,527

Int. Cl.³ B65D *55/14*

U.S. Cl. 70—168 **10 Claims**

1. A security device for the end of a pipe having a cap, said security device including:

a first housing member having:

a ring portion engaging the pipe;

locking portion means adapted for engagement with the cap; and

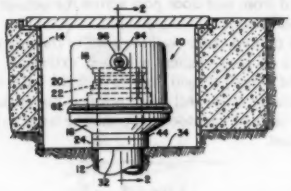
a housing portion extending between said ring portion and said locking portion means; and

a second housing member having:

a housing portion adapted to mate with said first housing member housing portion to form an enclosure about the cap; and

locking means positioned to engage said locking portion means of said first housing member to releasably lock said first and second housing members together, said locking portion means of said first housing member including:

a ring shaped flange extending inwardly from said housing



portion of said first housing member defining a cutout therein through which the pipe can be extended, and said ring shaped flange including:

an abutment surface facing the cap when said device is installed on the pipe; and

bearing means positioned between said abutment surface of said ring shaped flange and the cap, whereby said bearing means prevent torque applied to said security device from transferring to the cap around which said security device is installed.

4,506,530

KEY-OPERATED LOCK

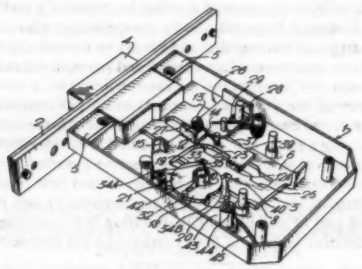
William K. Robinson, Coven, and Malcolm J. White, Parkside, both of England, assignors to Chubb & Son's Lock and Safe Company Limited, London, England

Filed Jun. 6, 1983, Ser. No. 501,229

Claims priority, application United Kingdom, Jun. 9, 1982, 8216725

Int. Cl.³ E05B *35/08*

U.S. Cl. 70—338 **6 Claims**



1. A lock comprising a bolt adapted to be moved from a first, withdrawn position to a second, thrown position and thence to a third, double-thrown position, and arranged such that a first correct key is effective to move the bolt between its first and second said positions and a second correct key, but not the first correct key, is effective to move the bolt between its second and third said positions, the lock comprising: a key-recognition mechanism comprising a plurality of movable detainers adapted to be set in first predetermined relative positions when engaged by the first correct key during the turning thereof and to be set in second preternined relative positions when engaged by the second correct key during the turning thereof; a movable detent associated with said detainers which is arranged normally to lie in a first position in which it blocks movement of the bolt; means for biasing said detent resiliently towards a second position in which it can release the bolt but movement of the detent into its said second position being permitted by the detainers only when the latter are set in their first or second said predetermined relative positions; a cam member rotatable by each said correct key which cam member is configured so as normally to maintain the detent in its said first position, but to permit the detent to move into its said second position when the respective correct key is turned such as to set the detainers in their first or second said predetermined relative positions, and to return the detent against said resilient bias to lie in its said first position after corresponding movement of the bolt; and a further movable member which is biased into a position in which it permits movement of the bolt between its first and second positions but blocks movement of the bolt between its second and third positions; the detainers, when set into their second said predetermined relative positions, being effective to move said further member out of its said position to permit movement of the bolt between its second and third positions, but the detainers when set into their first said predetermined relative positions, being ineffective to move the further member as aforesaid.

4,506,531

CONTROL METHOD AND APPARATUS FOR SCREWING DOWN REELING ROLLS

Kazuyuki Sakurada, 159-170 Taketoyo-cho, Kitanakane, Chita-gun, Aichi-ken; Yutaka Funyu, 4-10-16 Hanazone-cho, Handa-shi, Aichi-ken; Fusao Togashi, 46-1 Taketoyo-cho, Aza Minami Nagamune, Chita-gun, Aichi-ken; Toyoji Kanno, 5-4-1 Hanazono-cho, Handa-shi, Aichi-ken, and Toshikazu Masuda, 1-24 Agui-cho, Ooaza Miyazu Aza Kobasama, Chita-gun, Aichi all of Japan

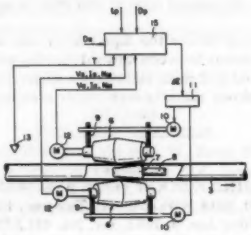
PCT No. PCT/JP81/00150, § 371 Date Mar. 15, 1983, § 102(e) Date Mar. 15, 1983, PCT Pub. No. WO82/00108, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 30, 1981, Ser. No. 355,728

Claims priority, application Japan, Jul. 4, 1980, 55-91294

Int. Cl.³ B21B *37/12*

U.S. Cl. 72—8 **2 Claims**



1. A method for controlling the automatic rolling of pipes in a reeling mill comprising the steps of:

determining the desired amount of reduction in wall thickness of said pipe being reeled;

continuously monitoring the voltage and current supplied to the rolling motor;

continuously monitoring the speed of said rolling motor;

calculating the torque of said rolling motor by a predetermined mathematical relationship of the voltage, the current and the speed of said rolling motor;

measuring the temperature of said pipe on the entry side of said rolling mill;

calculating the actual reduction in wall thickness based upon a predetermined relationship of said temperatures and said torque;

generating correction signals based upon the relationship between the desired reduction and said calculated actual reduction; and

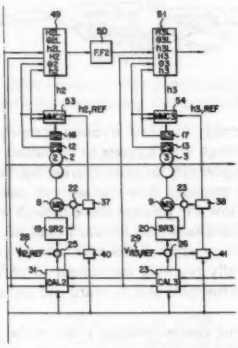
adjusting the screwing down of the reeling rolls in response to said correction signal.

4,506,532

METHOD FOR CONTROLLING CONTINUOUS ROLLING MILL AND CONTROL APPARATUS THEREFOR

Yoshiharu Anbe, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 1, 1983, Ser. No. 462,965
Claims priority, application Japan, Feb. 5, 1982, 57-17321
Int. Cl.[3] B21B *37/14*
U.S. Cl. 72—8 3 Claims



1. A method for controlling a continuous hot rolling mill having at least ith and (i+1)th stands, wherein an exit strip thickness reference value of an automatic gauge control is changed in accordance with a predetermined strip length during size changing and roll gap is corrected so as to change a strip thickness at an exit side of the ith stand, when a size (e.g., thickness) is changed during rolling, and, at the same time, a roll peripheral speed of the ith stand is changed in correspondence with a change in forward slip (a change in entry strip thickness, a change in exit strip thickness, and a change in resistance to deformation) of the ith stand as well as changes in forward slip, exit strip thickness, entry strip thickness and roll peripheral speed of the (i+1)th stand, in accordance with the following equations, so as to make the strip speed at the exit side of the ith stand coincide with the strip speed at an entry side of the (i+1)th stand:

$$\Delta V_{Ri}/V_{Ri} = -\Delta f_i/(1+f_i) + \Delta f_{i+1}/(1+f_{i+1})$$

$$+\Delta h_{i+1}/h_{i+1} - \Delta H_{i+1}/H_{i+1} + \Delta V_{Ri+1}/V_{Ri+1}$$

where

V_R: roll peripheral speed
f: forward slip
h: exit strip thickness
H: entry strip thickness
i, i+1: stand numbers
Δ: a small change

and

$$f_i = (\partial f_i/\partial H_i)\Delta H_i + (\partial f_i/\partial h_i)\Delta h_i + (\partial f_i/\partial k_i)\Delta k_i$$

where

k: strip resistance to deformation
∂f/∂H: partial differential coefficient
∂f/∂h: partial differential coefficient
∂f/∂k: partial differential coefficient.

4,506,533

METHOD OF FORMING SEAMLESS DRAWN AND IRONED CONTAINERS OF ALUMINUM STOCK

William Hessel, 706 70th St., Darien, Ill. 60559; Wayne D. Niemeyer, 1171 Londonberry La., Glen Ellyn, Ill. 60137; Surya K. Misra, 465 Menominee La., Naperville, Ill. 60540, and Richard A. Openchowski, 7012 Slayton, Woodridge, Ill. 60515

Continuation-in-part of Ser. No. 259,231, May 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 149,850, May 14, 1980, abandoned. This application Jan. 19, 1984, Ser. No. 572,056
Int. Cl.[3] B21D *51/26, 22/28*
U.S. Cl. 72—42 14 Claims

1. A method of forming a seamless drawn and ironed container of aluminum stock, said container having a bottom wall and an integral sidewall, comprising the steps of

(a) applying a thin layer of a lubricant to at least one of the two surfaces of said aluminum stock, said lubricant consisting essentially of unemulsified (i) peanut oil or (ii) at least one oleic acid ester of an aliphatic polyhydric alcohol containing at least three hydroxyl groups and wherein three or more of said hydroxyl groups of said aliphatic polyhydric alcohol are esterified with oleic acid, or mixtures of (i) and (ii); and

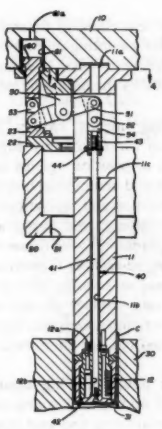
(b) converting said aluminum stock into a drawn and ironed container from said stock material without applying any additional lubricant thereto.

4,506,534

METHOD AND APPARATUS FOR REMOVING DRAWN CONTAINER FROM DRAW HORN

Stephen D. Doyle, North Canton, and Joseph D. Bulso, Jr., Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed Jan. 3, 1983, Ser. No. 455,318
Int. Cl.[3] B21D *22/00*
U.S. Cl. 72—345 10 Claims



1. Apparatus for removing a cylindrical member from a drawing horn carried by the inner slide of a double acting press having reciprocal inner and outer slides, comprising:

(A) an elongate draw horn and riser assembly secured to the inner slide for movement therewith toward and away from the base of the press;

(B) a stripper assembly carried by the inner slide and disposed within said draw horn and riser assembly for axial movement relatively therebetween; and

(C) actuating means carried by the outer slide for engaging said stripper assembly while moving said draw horn and

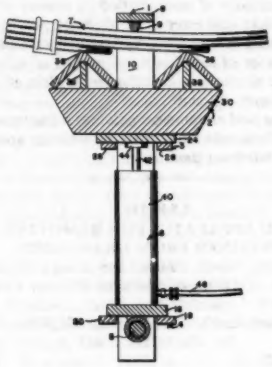
riser assembly axially relatively thereof during movement of the inner and outer slide away from the base of the press.

4,506,535

DEVICE HAVING POWER MEANS FOR RE-ARCHING OR DE-ARCHING A LEAF SPRING

Bobby G. Eubanks, 2074 Battle Rd., Augusta, Ga. 30904

Filed Dec. 3, 1982, Ser. No. 446,741
Int. Cl.³ B21D 31/00
U.S. Cl. 72—389 13 Claims



1. In a device for re-arching or de-arching a leaf spring:

a contact means for mounting on one side of said leaf spring and having a contact portion thereon,

spaced spring contacts for mounting on the opposite side of said spring,

removable bending means having said spaced spring contacts thereon for removably supporting said spaced spring contacts in position against said opposite side of said spring and said removable bending means being removable for inversion and repositioning on said spring for de-arching the spring, said removable bending means having a flat, planar bottom thereon contacted but not connected during re-arching to push said removable bending means against said spring and said bottom being inverted against said contact portion when said spring is dearched, said bending means also having a flat, planar top thereon contacted but not connected when said spring is de-arched,

power means for power driving against said flat, planar bottom to force said spaced spring contacts against said spring during re-arching and said power means comprising a power member having a flat, planar power member top removably contacting said flat, planar bottom of said removable bending means in only a single plane during re-arching and being repositionable for de-arching a spring by applying power against said spring when said removable bending means is repositioned with the flat, planar bottom thereof against the contact portion of said contact means and with the flat, planar bottom contacted by but not connected to the flat top of the power member, and

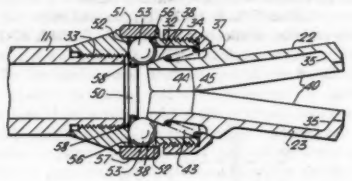
support means for said power means.

4,506,536

JAW ASSEMBLY FOR BLIND RIVETING

Ronald L. C. Clarke, and Donald S. Savage, both of St. Albans, England, assignors to Avdel Limited, Hertfordshire, England

Filed Jun. 17, 1983, Ser. No. 505,499
Claims priority, application United Kingdom, Jul. 2, 1982, 8219284
Int. Cl.³ B21P 9/05
U.S. Cl. 72—391 8 Claims



1. A jaw assembly for blind riveting comprising:

a housing through which rivets to be placed are fed successively to a plurality of jaws carried by the housing, the jaws being movable between an open position in which the jaws allow the passage therethrough of a rivet and a closed position in which forward ends of said jaws form an abutment to support the rivet during placing thereof, by a generally pivoting movement of each jaw about a position intermediate said forward end and a rearward end thereof;

and jaw opening means operable to move the jaws from said closed position to said open position, the jaw-opening means comprising:

a rotatable member which is rotatable about the housing and around a path along which the rivets are fed;

and a movement-transmission member interposed between the rotatable member and the rearward part of each jaw member,

means associated with said rotatable member and each said movement-transmission member for moving each said movement-transmission member inwardly upon rotation of said rotatable member so as to press each said movement-transmission member radially inwardly on the rearward part of the associated jaw and cause the jaw to pivot from said closed to said open position.

4,506,537

DIE FOR SPLINING THIN-WALL POWER TRANSMITTING MEMBERS

Carl E. Anderson, Clinton Township, Macomb County, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Filed Dec. 6, 1982, Ser. No. 447,244
Int. Cl.³ B21D 17/04, 9/14
U.S. Cl. 72—469 15 Claims

1. In a toothed die for forming splines in a thin-wall annular sleeve of a power transmitting member by meshing the die teeth and teeth of a toothed mandrel on which the sleeve is mounted between the meshing teeth so as to thereby form thin-wall splines in the sleeve as the mandrel rotates about a central axis, said die comprising: a plurality of leading tooth groups each of which includes partial teeth of a progressively changing height from one tooth to the next tooth of the same

group; each of said leading tooth groups having an average tooth height that is approximately equal to the average tooth

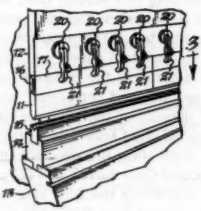
height of each other leading tooth group; and a trailing tooth group of full teeth for completing the thin-wall splining.

4,506,538

PUNCH-CLAMPING CONSTRUCTION FOR PRESSES

Clarence O. Jones, Jr., Buffalo, N.Y., assignor to Niagara Machine & Tool Works, Buffalo, N.Y.

Filed Sep. 21, 1983, Ser. No. 534,481
Int. Cl.³ B21D *37/04*
U.S. Cl. 72—481 **8 Claims**



1. A clamp construction for mounting a punch on the ram of a press comprising an elongated ram, an elongated stationary jaw on said elongated ram, a first punch gripping portion on said elongated stationary jaw, an elongated movable jaw, mounting means on said elongated movable jaw for movably mounting said elongated movable jaw on said elongated ram, a second punch gripping portion on said elongated movable jaw in opposition to said first punch gripping portion for mounting a punch therebetween, a plurality of spring means spaced lengthwise of said elongated ram, coupling means for coupling said plurality of spring means to said elongated movable jaw for biasing said elongated movable jaw toward said elongated fixed jaw, and motor means mounted on said elongated ram for moving said elongated movable jaw away from said fixed jaw in opposition to the force exerted by said spring means.

4,506,539

DYNAMIC PRESSURE COMPARATOR

Richard O. Hessler, Somerville, Ala., assignor to Thiokol Corporation, Chicago, Ill.

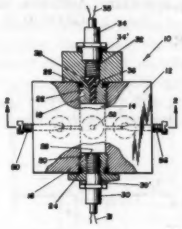
Filed Jan. 14, 1983, Ser. No. 458,002
Int. Cl.³ G01L *27/00*
U.S. Cl. 73—4 R **12 Claims**

1. A dynamic pressure comparator comprising

body means having a gas flow inlet port, a gas flow outlet port, and a third port,

acoustical cavity providing means included in said body means for providing an acoustical cavity, said acoustical cavity providing means including a first transducer carrier and a second transducer carrier, said first and second transducer carriers being disposed in spaced relationship with said acoustical cavity therebetween,

said body means further including a first passageway connecting said inlet port to a first region of said cavity, a second passageway connecting said outlet port to a second region of said cavity, and a third passageway connecting said third port to a third region of said cavity, said first, second and third regions being in substantially the same plane midway between said first and second transducer carriers with a portion of each of said first and second passageways being in alignment with each other, and



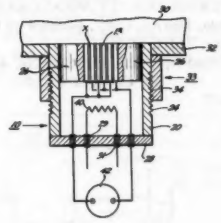
adjustable gas flow restriction means included in each of said aligned portions of said first and second passageways.

4,506,540

LIQUID SENSOR AND THE USE THEREOF IN CONTROLLING THE CORROSION OF PIPELINES

Glenn A. Marsh, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 24, 1983, Ser. No. 460,131
Int. Cl.³ G01N *27/00*
U.S. Cl. 73—29 **19 Claims**



1. A liquid water sensor for use in a pipeline utilized to transport a carbon dioxide-containing gas which comprises:

(a) a plurality of conductive members spaced from each other by an insulating medium, said conductive members being serially connected in alternating pairs,

and

(b) a continuity detector being serially connected to each pair of conductive members, wherein said conductive members are spaced at a distance enabling a droplet or film of water to bridge at least two alternate conductive members to provide a conductive pathway therebetween.

4,506,541

MEASUREMENT OF BULK DENSITY OF PARTICULATE MATERIALS

Jock B. Cunningham, Mount Isa, Australia, assignor to Mount Isa Mines Limited, Australia

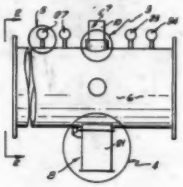
PCT No. PCT/AU82/00028, § 371 Date Oct. 15, 1982, § 102(e) Date Oct. 15, 1982, PCT Pub. No. WO82/03273, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 16, 1982, Ser. No. 438,882

Claims priority, application Australia, Mar. 16, 1981, PE8014

Int. Cl.³ G01N *9/24*

U.S. Cl. 73—32 R **6 Claims**



1. A bulk density measuring apparatus comprising:

uncollimated radiation source means;

uncollimated radiation detector means spaced from said source means to measure radiation received therefrom;

containment means for the material of which the density is to be determined such that a charge of the material within said containment means occupies the space between the source means and detector means, said containment means comprising a duct along which said material is caused to flow, said radiation means and said radiation source means being mounted externally of said containment means;

a radiation opaque shield positioned to prevent direct radiation from the source means reaching the detector means; and

radiation transparent windowpanes respectively associated with the detector means and source means, the radiation entering and leaving the containment means through said windowpanes, each said windowpane being inclined relative to the direction of flow with its downstream edge more outboard of the duct wall than its upstream edge.

4,506,542

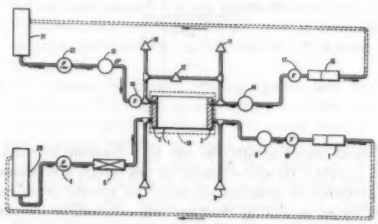
APPARATUS AND PROCEDURE FOR RELATIVE PERMEABILITY MEASUREMENTS

Walter D. Rose, Denver, Colo., assignor to Chandler Engineering Company, Tulsa, Okla.

Filed Apr. 22, 1983, Ser. No. 487,768

Int. Cl.³ G01N *15/08*

U.S. Cl. 73—38 **22 Claims**



4. An apparatus for determining data from which to calculate the relative permeability to fluid flow of a porous body having a front side and a back side wherein said device comprises:

(a) means for rendering all sides but said front side and said back side of said porous body impermeable to a first fluid and a second fluid;

(b) a first porous barrier held in contact with said front side of said porous body, wherein said contact permits a first fluid to flow from said first porous barrier to said front side of said porous body;

(c) a second porous barrier held in contact with said back side of said porous body, wherein said contact permits a first fluid to flow from said back side of said porous body to said second porous barrier;

(d) a first fluid flow system in communication with said first porous barrier and said second porous barrier;

(e) means for forcing a first fluid to flow through said first fluid flow system, said porous barriers, and said porous body;

(f) means for measuring the pressure of said first fluid in said first fluid flow system before said first fluid encounters said first porous barrier;

(g) means for measuring the pressure of said first fluid in said first fluid flow system after said first fluid leaves said second porous barrier;

(h) means for regulating the pressure of said first fluid after said first fluid leaves said second porous element;

(i) means for measuring the flow rate of said first fluid through said first fluid flow system;

(j) means for regulating the flow rate of said first fluid through said first fluid flow system;

(k) a second fluid flow system in communication with said front side of said porous body and said back side of said porous body;

(l) means for forcing said second fluid to flow through said second fluid flow system and said porous body;

(m) means for regulating the pressure of said second fluid before said second fluid enters said porous body;

(n) means for measuring the pressure of said second fluid before said second fluid enters said porous body;

(o) means for measuring the pressure of said second fluid after said second fluid leaves said porous body;

(p) means for regulating the pressure of said second fluid after said second fluid leaves said porous body; and

(q) means for measuring the flow rate of said second fluid through said second fluid flow system.

4,506,543

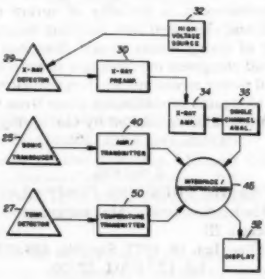
ANALYSIS OF SALT CONCENTRATIONS

Arthur J. Kamp, Oakley, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 20, 1983, Ser. No. 506,072

Int. Cl.³ G01N *15/00*

U.S. Cl. 73—61 R **8 Claims**



1. A method for determining the respective concentrations in a liquid medium of (a) a first salt component and (b) a second salt component, said method comprising the steps of:

(1) measuring sound velocity in the liquid medium;

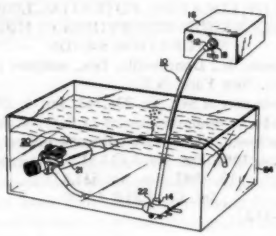
(2) measuring absorption of low-energy X-rays by the liquid medium;
(3) determining temperature of the liquid medium in the region where sound velocity is measured; and
(4) calculating the concentrations of (a) and (b) from predetermined empirical formulae relating sound velocity at the measured temperature and X-ray absorption in the liquid medium to the concentrations of (a) and (b).

4,506,544

LEAKAGE DETECTOR OF ENDOSCOPES

Yoshihito Shimizu, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 21, 1983, Ser. No. 477,409
Claims priority, application Japan, Mar. 19, 1982, 57-44273
Int. Cl.³ G01M *3/08*
U.S. Cl. 73—45.5 **8 Claims**



1. A leakage detector for endoscopes, comprising:
a first connector member to be connected to a compressed air source;
a second connector member to be connected to a compressed air inlet portion of an endoscope of the perfect watertight structure for feeding compressed air to the inside of said endoscope;
a communicating tube for connecting said first and second connector members; and
a pressure regulator which is formed in at least one of said first and second connector members and said communicating tube for regulating the pressure of compressed air in said endoscope when said leakage detector is connected between a source of compressed air and an endoscope of the perfect watertight structure.

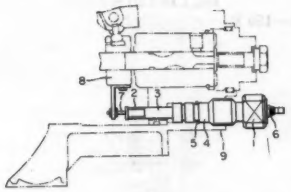
4,506,545

SENSOR FOR DETECTING FLOW QUANTITY OF FUEL SUPPLIED TO FUEL INJECTION SYSTEM

Masatoshi Yamada; Eiichi Yasuda; Masanobu Kimura, all of Aichi; Tatehito Ueda, and Eiji Hashimoto, both of Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 18, 1982, Ser. No. 379,436
Claims priority, application Japan, May 20, 1981, 56-71844[U]
Int. Cl.³ G01M *15/00*; F02M *39/00*
U.S. Cl. 73—119 A **7 Claims**

1. A sensor for detecting the flow quantity of fuel supplied to a fuel injection system having a spill-ring, said sensor comprising:
a detection member comprising a rod member fixed to the spill-ring of the fuel injection system for movement in axial direction thereof in response to movement of the spill-ring,
a coil assembly comprising
a bobbin including a cylindrical member having a hollow end portion with an axial hole therein facing said detection rod member, said rod member being inserted in said axial hole without contacting the inner wall of said axial hole,
first coil means for detecting displacement of said rod member as a variation in inductance of said coil means, said first coil means being wound around said hollow end portion of said bobbin, and
second coil means for detecting variation of temperature as a function of variation in inductance of said second means, said second coil means being wound around said bobbin adjacent said first coil means with a predetermined spacing therebetween, said first coil means being closer to said detection rod member than is said second coil means,
whereby displacement of said rod member is detected in response to the movement of the spill-ring as a variation in inductance by said coil assembly to provide a measure of the flow quantity of fuel with temperature compensation,



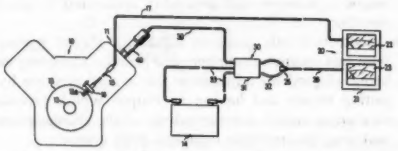
a pump-fixing member comprising a hollow cylindrical body threadably connected to said bobbin, said hollow cylindrical body having an outer surface and including external threads for adjustable attachment to an external body to adjustably fix the relative relation between the reference position of the spill-ring and the sensor, a seal on said outer surface of said cylindrical body, and an output terminal secured to said pump-fixing member at an end thereof, and a lead wire connected to said first coil means and said terminal and passing through a groove provided in an external surface of said coil bobbin, a penetration hole provided in said pump-fixing member at the other end thereof and an internal hollow space provided in said pump-fixing member.

4,506,546

ADAPTER FOR CONVERTING LUMINOSITY SIGNALS INTO INDUCTIVE SIGNALS

Gene E. Olson; Christopher B. Stout; Donald D. Grover, and Thomas P. Becker, all of Kenosha, Wis., assignors to Snap-On Tools Corporation, Kenosha, Wis.

Filed Jun. 6, 1983, Ser. No. 501,718
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—119 A **3 Claims**



1. An adapter for converting luminosity signals generated during combustion in an engine into inductive signals, the engine including an engine block and a plurality of cylinders therein and a plurality of openings communicating therewith, said adapter comprising a body member adapted to be mounted in a selected opening of the engine and being exposed to light in the associated cylinder during combustion therein, photodetector means in said body member for converting luminosity signals during combustion in the cylinder to electrical signals, a timer circuit responsive to the inception of each electrical signal to produce a timer signal persisting for a pre-

determined duration, means for differentiating each timer signal to produce a spike at the commencement thereof, and a pickup loop coupled to said differentiating means for producing an inductive signal in response to each spike.

4,506,547

APPARATUS FOR USE IN THERMOMECHANICAL ANALYSIS

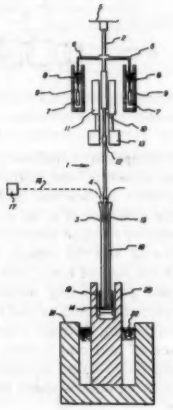
Wolfgang Kunze, Rodgau, and Bernd Schweckendieck, Gr. Umstadt, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Continuation of Ser. No. 420,977, Sep. 21, 1982, abandoned. This application Apr. 4, 1983, Ser. No. 481,545

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137603

Int. Cl.³ G01N *11/12*

U.S. Cl. 73—150 R **3 Claims**



1. Apparatus for thermomechanical analysis of a sample, said apparatus comprising, in combination:

a load member, said load member being guided in the vertical direction;

a sample receptacle in which one end of said load member is supported by said sample, said receptacle being provided with means for introducing a gas thereinto during said analysis;

means for controllably varying the temperature of said sample receptacle over a preselected range;

a magnetic member undisplaceably connected to said load member;

an electromagnetic position signalling means interacting with said magnetic member, said position signalling means being adapted for adjustment into a zero position by adjusting means and having an output which provides a measuring signal corresponding to the displacement of said magnetic member from said zero position;

a plate, proximate the other end of said load member and connected thereto, for receiving a weight whereby said sample is subjected to a static load;

means, affixed to said load member between said plate and magnetic member, for floatingly mounting said load member; said means including at least one immersion member and a container for an immersion medium in which said immersion member is received;

means for subjecting said sample to a dynamic load, said dynamic loading means including an electromagnet and an armature, said armature being connected to said load member;

means for recording said measuring signals as a function of temperature;

said load member being provided intermediate said plate and said signaling means with three angled arms at the free ends of which said immersion members are disposed; and

said container forms a chamber comprising an oil filling and a separate chamber is provided for each said immersion chamber.

4,506,548

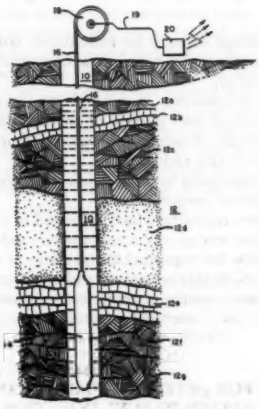
METHOD OF LOCATING POTENTIAL LOW WATER CUT HYDROCARBON RESERVOIRS IN HIGH WATER SATURATION SANDS

Joseph Zemanek, Jr., Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 336,743, Jan. 4, 1982, Pat. No. 4,413,512, and a continuation-in-part of Ser. No. 382,017, May 26, 1983, abandoned, which is a continuation-in-part of Ser. No. 336,743, Jan. 4, 1982, Pat. No. 4,413,512. This application Sep. 13, 1983, Ser. No. 531,872

Int. Cl.³ E21B *47/00*

U.S. Cl. 73—152 **8 Claims**



1. Method of locating potential low water cut hydrocarbon producing zones in a formation composed primarily of sand comprising the steps of:

traversing a length of a borehole extending into the formation with logging tools which generate first signals indicating porosity of the formation along said length second signals indicating total water saturation of the formation along said length;

determining from said first and second signals pairs of values representing porosity and fractional water saturation of the formation at a multiplicity of levels along said length;

determining a linear water saturation function from at least a subset of said pairs of values;

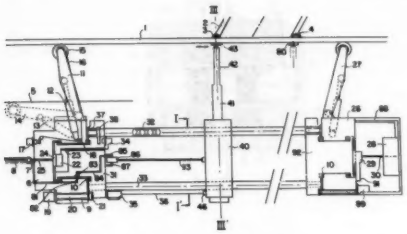
determining irreducible water saturation of the formation along at least a portion of said length from said linear water saturation function and the indicated formation porosity along said portion of said length; and

plotting the irreducible water saturation and fractional water saturation for said portion of said length of the formation.

4,506,549
METHOD AND DEVICE FOR THE AUTOMATIC CHECKING OF THE SOUNDNESS OF THE WELDS OF MECHANO-WELD ASSEMBLIES

Paul Thome, 8 rue Coutureau, Saint Cloud, France (92210)

Filed Dec. 3, 1981, Ser. No. 327,033
Claims priority, application France, Dec. 9, 1980, 80 26071
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—582 **6 Claims**



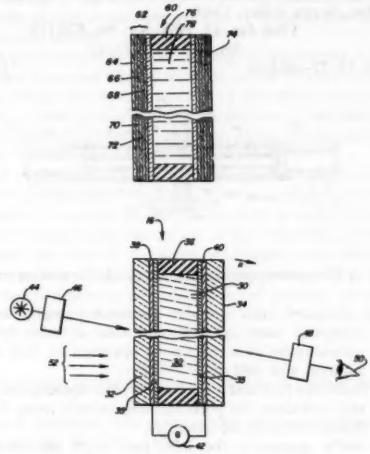
1. A device for the automatic, non-destructive test scanning of welds between two members, at least one of which is hollow, comprising a carriage movable inside the hollow member, a radial telescopic arm borne on said carriage with, at its end, an inspection head with sensors and having four degrees of freedom: (i) along an axis of the carriage, (ii) radially, (iii) in rotation around the axis of the carriage, and (iv) in rotation on itself; the carriage comprising two fixed ends, bearing wheels for centering the carriage in the hollow member and a system of locking the carriage against the hollow member, which system has two flanges connected by guide rails forming a mechanism rotatable on itself between the two fixed ends, and a drum which is moved on guide rails and which bears a telescopic radial arm capable of rotating on itself, having the inspection head at its end.

4,506,550
NON-DESTRUCTIVE TESTING SYSTEM EMPLOYING A LIQUID CRYSTAL DETECTOR CELL

Jaswinder S. Sandhu, Chicago, Ill., assignor to Raj Technology Partnership, Chicago, Ill.

Continuation-in-part of Ser. No. 232,247, Feb. 6, 1981, Pat. No. 4,379,408, which is a continuation-in-part of Ser. No. 224,173, Jan. 12, 1982, abandoned. This application Jul. 20, 1982, Ser. No. 399,997
Int. Cl.³ G01N *29/00*; G02F *1/11*
U.S. Cl. 73—603 **77 Claims**

1. An ultrasonic imaging system for use in non-destructively and non-invasively testing objects, which includes a source or beam of ultrasonic energy, a liquid crystal detector cell acoustically coupled to said beam for displaying a real-time image of a test object, and an optical viewing system for illuminating the image on the cell, wherein said cell includes a pair of closely spaced and parallel covers, the ultrasonically active area of each being of a substantially uniform thickness, said covers encasing a nematic liquid crystal material whose alignment is indicated by a director, said material exhibiting field birefringence in response to acoustic energy, said cell being matched to the frequency of the ultrasonic energy, by each of said covers being substantially acoustically transparent to ultrasonic beams incident on said covers at normal and oblique angles and the liquid crystal alignment as indicated by the

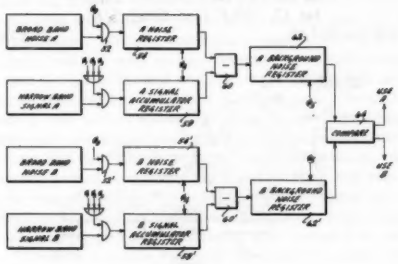


director being oblique relative to the covers, and said cell exhibiting high sensitivity and high image resolution.

4,506,551
TRANSDUCER SELECTING SYSTEM

David J. Ray, San Juan Capistrano, Calif., assignor to Becton Dickinson and Company, San Juan Capistrano, Calif.

Filed Sep. 30, 1982, Ser. No. 430,048
Int. Cl.³ G01N *29/00*; G08B *21/00*
U.S. Cl. 73—660 **14 Claims**



7. A method for selecting from among a plurality of transducers in a noisy environment, each transducer generating broad band information signals and narrow band information signals at frequencies of interest, to provide information to a system, the method comprising the steps of:

a. subtracting from the broad band information signals the narrow band information signals to produce signals representing the background noise component of said broad band information signals;

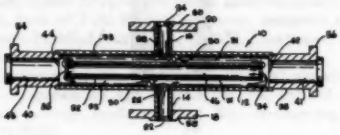
b. comparing the magnitudes of background noise signals attributable to each transducer;

c. selecting the transducer with the least background noise; whereby the transducer having the lowest background noise is selected to supply information to the system.

4,506,552
COAXIAL FLOWPATH APPARATUS

Alvin E. Brown, Santa Cruz, and Donald P. Henneuse, Scotts Valley, both of Calif., assignors to Manning Technologies, Inc., Scotts Valley, Calif.

Filed Jan. 12, 1984, Ser. No. 570,179
Int. Cl.[3] G01F 15/14
U.S. Cl. 73—861.28 19 Claims



1. A flowpath apparatus for ultrasonic flowmeters comprising,

an elongated inner cylinder, mounted coaxially within an elongated outer cylinder, said inner cylinder defining a measurement path and having openings for fluid communication with said outer cylinder,

a fluid inlet port and a fluid outlet port opening into one of said cylinders, the ports opening radially away from the common axis of the cylinders,

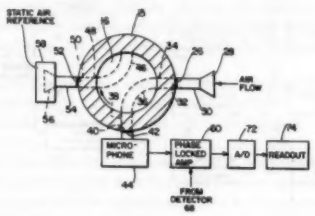
a baffle separating the inlet port from the outlet port whereby a flow path is formed through a substantial length of one cylinder before passing through the second cylinder, and

means for mounting ultrasonic transducers on the same common axis of the cylinders for receiving and sending ultrasonic signals parallel to flow in the inner cylinder.

4,506,553
APPARATUS FOR MEASURING SMALL VALUES OF AIR FLOW

Charles W. Bruce; Kenneth E. Kunkel, and Fred C. Webb, all of Las Cruces, N. Mex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 538,071
Int. Cl.[3] G01F 1/36; G01P 5/17
U.S. Cl. 73—861.65 10 Claims



1. A sensor for measuring gas flow comprising:

a housing having

(a) a first orifice for receiving dynamic gas flow therethrough,

(b) a second orifice spaced from the first and communicating with a static gas or other reference environment,

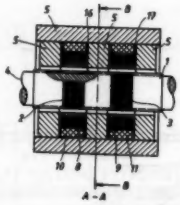
(c) a third orifice spaced from the other two and communicating with a microphone;

rotor means located inwardly of the housing and having first and second curved passageways therein for alternately completing a passage between the third orifice, and the first then second orifices thus subjecting the microphone to a resultant acoustic wave dependent upon the dynamic gas flow.

4,506,554
MAGNETOELASTIC TORQUE TRANSDUCER

Kent Blomkvist, Surahammar, and Jan O. Nordvall, Västerås, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 7, 1983, Ser. No. 501,799
Int. Cl.[3] G01L 3/10
U.S. Cl. 73—862.36 5 Claims



1. A magnetoelastic torque transducer comprising:

an axle provided with a soft-magnetic sleeve permanently attached to said axle, said sleeve having two parallel, ring-formed measuring zones at a certain distance from each other, each measuring zone being formed by a number of parallel slits which in one of said measuring zones make an angle of about 45° with a generating line of the sleeve surface and in the other measuring zone make an angle of about −45° with said line,

two stationary coils, each concentric with one of said measuring zones, said coils arranged to be series-fed with alternating current for inducing an alternating magnetic flux in said sleeve,

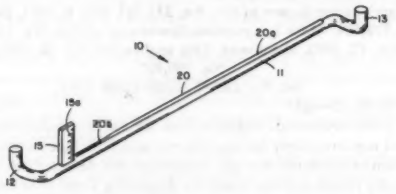
two other stationary coils, each concentric with one of said two stationary coils, these other coils connected in series opposition to a phase sensitive rectifier connected to an indicating instrument, and

a core of soft-magnetic material concentric with said axle, said core together with said sleeve closing said magnetic flux and with a middle wall separating the two zones and their respective coils.

4,506,555
CABLE TENSION MEASURING DEVICE

Charles E. McCubbin, Mustang, Okla., assignor to Baker Drilling Equipment Company, Orange, Calif.

Filed Oct. 7, 1983, Ser. No. 540,152
Int. Cl.[3] G01L 5/06
U.S. Cl. 73—862.46 13 Claims

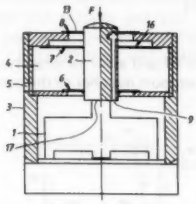


1. Apparatus for indicating the degree of tension applied to a length of flexible cable comprising a resiliently deformable elongated rod; cable engaging hook elements projecting transversely in diametrically opposite directions from each end of said rod, whereby the engagement of said hook elements with the cable deflects the cable into a helical configuration; and means for indicating the longitudinal bending of said rod in response to the application of tensile stress to said cable.

4,506,556
PRESSURE-COMPENSATING DEVICE IN LOAD CELLS

Sture Siby, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 28, 1983, Ser. No. 508,508
Claims priority, application Sweden, Jul. 1, 1982, 8204072
Int. Cl.[3] G01D 3/04; G01L 1/26
U.S. Cl. 73—862.63 7 Claims



7. A pressure-change compensating unit comprising:

a force-transmitting member located within and resiliently supported from a surrounding housing

characterized in that

the force-transmitting member is sealed in vacuum-tight manner to three spaced-apart diaphragm means, the perimeter of each of which diaphragm means is sealed in vacuum-tight manner to the housing,

in that a volume is defined in the housing between one outer and the intermediate diaphragm means, which volume communicates, by a duct means formed in the force-transmitting member, with the end of said force-transmitting member closest to said other outer diaphragm means,

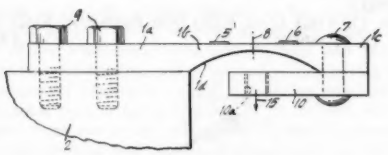
in that the housing is provided with an opening to ensure that the inwardly facing surfaces of the other outer and intermediate diaphragm means are subjected to atmospheric pressure,

and in that the area of the intermediate diaphragm means is larger than the area of either of the outer diaphragm means.

4,506,557
LOAD CELL APPARATUS

Walter E. Jacobson, Meriden, and Anthony H. Cibelli, Yalesville, both of Conn., assignors to Revere Corporation of America, Wallingford, Conn.

Filed Mar. 24, 1983, Ser. No. 478,235
Int. Cl.[3] G01L 1/22
U.S. Cl. 73—862.65 1 Claim



1. Strain sensing apparatus, comprising:

a. a single elongated beam having one end portion adapted for mounting on a fixed support, an opposite end portion adapted to receive a force acting at right angles to the length of the beam, and an arch-shaped portion connecting said end portions, said end portions having substantially equal and constant cross-sectional areas and said connecting portion having opposed flat and part-cylindrical surfaces and a cross-sectional area which decreases gradually from said equal area at each end to a minimum at its center;

b. a plurality of strain gage resistance elements fixed on said flat surface of the connecting portion and spaced from the middle of said connecting portion in opposite directions from said middle;

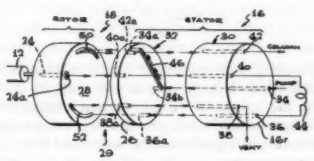
c. said part-cylindrical surface having its axis at right angles to said force and aligned with the middle of the connecting portion and having a radius of curvature sufficiently large so that the strain gage elements may be mounted on said connecting portion at regions of low strain gradient; and

d. said strain gage elements being short as compared to the half-lengths of the connecting portion and located at the middle of said half-lengths where there is minimal variation in strain along the length of the connecting portion when the load on the beam is constant, said elements having their centers at locations of maximum strain in said connecting portion and being fixed at locations of equal and opposite strain.

4,506,558
INJECTOR WITH MINIMAL FLOW-INTERRUPT TRANSIENT

Stephen R. Bakalyar, Sebastopol, Calif., assignor to Rheodyne Incorporated, Berkeley, Calif.

Filed Mar. 3, 1983, Ser. No. 471,753
Int. Cl.[3] G01N 1/10
U.S. Cl. 73—863.72 9 Claims



1. In an injector which includes a rotor that can pivot between load and inject positions about an axis and that has a sample-receive port for receiving a sample, and which also includes a stator with pump, column, first-sample, vent, and second-sample ports, and with the rotor having first and second channels at the rotor-stator interface, each channel having leading and trailing edges, the first channel connecting the pump and column ports at the load position and connecting the column and first-sample ports at the inject position, and the second channel connecting the second-sample and vent ports in the load position and coupling the second-sample port to the pump port in the inject position, the improvement wherein:

said pump port includes a pump inlet spaced from said stator-rotor interface, first and second spaced pump openings in said stator at the stator-rotor interface, and a conduit in said stator which connects said pump inlet to said first and second pump openings;

said column port has an opening at the stator-rotor interface and said first pump opening has an edge that lies at an angle of less than 10° about said axis from the nearest edge of said column opening, said second pump opening is spaced by more than twice said angle from said first pump opening, and said second channel is positioned so that in the inject position said second channel connects the second-sample opening to said second pump opening; and

said second channel is positioned so that at a transition position at which the trailing edge of the first channel breaks connection with said pump port, during rotor pivoting toward the inject position, the leading edge of the second channel lies within 10° of connection with the pump port.

4,506,559

SPLIT PULLEY

Kurt O. Francke, Huddinge, and Sten T. Strand, Nynäshamn, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

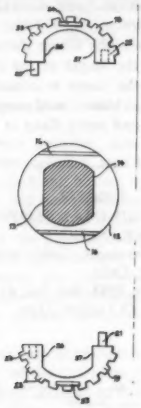
PCT No. PCT/SE82/00035, § 371 Date Oct. 25, 1982, § 102(e) Date Oct. 25, 1982, PCT Pub. No. WO82/03110, PCT Pub. Date Sep. 16, 1982

PCT Filed Feb. 9, 1982, Ser. No. 438,893

Claims priority, application Sweden, Mar. 10, 1981, 8101482

Int. Cl.³ F16H *55/12*; B21D *53/28*; B21H *5/00*; B25G *3/00*

U.S. Cl. 74—439 **4 Claims**



1. In an arrangement provided with a substantially cylindrical rotatable shaft having pins at the ends of said shaft for supporting the same, the improvement comprising: spaced integral flanges on said shaft, two diametrically opposed plane surfaces on said shaft positioned between said flanges, a driving pulley, corresponding profile surfaces on the inside of the driving pulley for effecting non-rotatable connection between said shaft and said driving pulley, said driving pulley constituting a unit with said shaft and including two identical semicircular portions which are mounted on said shaft between said flanges, and said flanges being provided with notches on surfaces thereof facing each other, and protruding elements formed on the inner side walls of said portions which are adapted to snap into said notches during assembly of the driving pulley on said shaft.

4,506,560

CONTROL LINKAGE

Richard Treichel, Cedar Falls, and Daniel M. Johnson, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 20, 1982, Ser. No. 450,878

Int. Cl.³ G05G *9/16*

U.S. Cl. 74—473 R **5 Claims**

1. A control linkage capable of compensating for relative motion between a first member which is isolated from a second member, said control linkage comprising:

(a) a support member rotatably and pivotally attached between said first and second members, said support member including radial arm means;

(b) first and second outwardly extending attachment devices joined to said radial arm means;

(c) a first rod connecting said first member to said first attachment device at a first joint; and

(d) a second rod connecting said second member to said second attachment device at a second joint, said first and second joints lying approximately in respective planes which are parallel and pass through the respective points where said support member is pivotally attached to said first and second members, wherein displacement of said second rod from its original position to a second position, due to the presence of relative motion between said first and second members, is computed using the following equations:

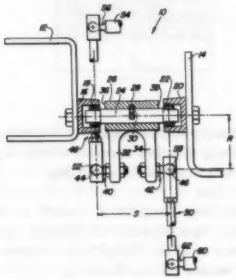
$$E = R - R \cos \theta$$

$$R = A \sin \phi, \text{ and}$$

$$\theta = \arctan D/S$$

where:

A is the length of said arms as measured from the central axis of said support member to the centers of the spherical ends connecting the first and second rods to the respective arms,



D is the displacement of said first rod from its initial position to a second position;

E is the displacement of said second rod from its initial position to a second position, which displacement is less than the maximum amount of displacement which would cause said gear shift mechanism to move an undesirable amount;

R is the vertical projection of A as measured from the central axis of said support member; and

S is the length of said support member as measured between the points where it is pivotally connected to said first and second members.

4,506,561

TRANSMISSION HOUSING

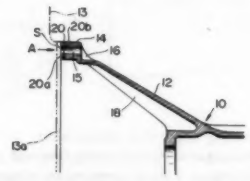
Yoshikazu Hayakawa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1981, Ser. No. 328,016

Claims priority, application Japan, Dec. 11, 1980, 55-76709[U]

Int. Cl.³ F16H *57/02*; B23Q *7/00*; B65D *8/10*; F16D *1/00*

U.S. Cl. 74—606 R **4 Claims**



1. A transmission housing, comprising:

a bell housing made of a first material comprising a light alloy said bell housing having a front end section connected to an engine block, said bell housing being formed at said front end section with a generally annular attach-

ment flange through which said bell housing is connected to said engine block, said attachment flange defining thereinside a bell mouth; and

a lip supporting member made of a second material which is higher in rigidity than said first material and comprises steel, said lip supporting member being securely attached to said bell housing front end section, said lip supporting member being located along the periphery of the bell housing front end section, said attachment flange having a generally annular flat surface and said lip supporting member being generally annular and fastened on said generally annular flat surface of said attachment flange.

4,506,562

UNITARY AIR BLEED DEVICE

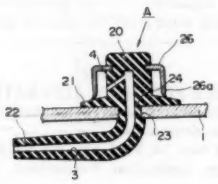
Tadao Yamaura, and Susumu Nishihata, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 230,432, Feb. 2, 1981, abandoned. This application Mar. 28, 1984, Ser. No. 594,411

Claims priority, application Japan, Feb. 28, 1980, 55-24460

Int. Cl.³ F16H *57/02;* **F16K** *15/14*

U.S. Cl. 74—606 R **5 Claims**



5. An air bleed device for a housing having a mating hole, said housing enclosing an automotive component which is lubricated by oil, said air bleed device comprising:

a head portion having a vent hole formed therein and a flange portion for engaging an exterior surface of said housing;

a cylindrical portion having a connecting passage therethrough in communication with said vent hole of said head portion, said head portion and cylindrical portion forming an elastomeric body operable to be removably mounted, by press fitting, into said housing by deformation of said elastomeric body whereby said vent hole opens into said housing, said cylindrical portion having a waist portion adapted to engage said mating hole, said cylindrical portion being operable to be inclined with respect to an axis of said mating hole to thereby extend into said housing in a predetermined direction inclined with respect to a flushing direction of said oil, said waist portion and said mating hole having complimentary cross sections operable to firmly orient said cylindrical portion in said predetermined direction; and

a cap engaging said head portion and having a peripheral edge portion contacting said flange portion to define a chamber between said cap, said head portion, and said flange portion, wherein said peripheral edge portion is operable to flex out of contact with said flange portion in response to a predetermined pressure differential between an inside and outside said housing.

4,506,563

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION GEAR

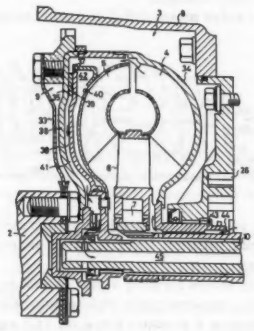
Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,311

Claims priority, application Japan, Sep. 29, 1981, 56-154266

Int. Cl.³ B60K *41/04;* **F16H** *3/74*

U.S. Cl. 74—867 **4 Claims**



1. A hydraulic control system for an automatic transmission of a four forward speed type including at least three clutches which are hydraulically controlled by hydraulic oil and two brakes which are hydraulically controlled by hydraulic oil, one of said three clutches being a friction clutch which is engaged to attain a third speed ratio, another of said three clutches being a friction clutch disconnectably connecting an input shaft to a carrier of a planetary gearing of Ravigneawx type and which is engaged to attain a fourth speed ratio, said hydraulic control system comprising rotation speed detecting means for detecting synchronous rotation between said input shaft and said carrier, hydraulic oil pressure control means for controlling the pressure of hydraulic oil so that hydraulic oil at a predetermined reduced pressure is supplied to said third-speed attaining friction clutch during a shift from a second speed ratio to the third speed ratio and the pressure of hydraulic oil supplied to said third-speed attaining friction clutch is increased when said rotation speed detecting means detects synchronous rotation of said input shaft and said carrier, and a directional control valve which is changed over from one position to another with a rise of the pressure of hydraulic oil supplied to said third-speed attaining friction clutch during the shift from the second speed ratio to the third speed ratio thereby permitting supply of hydraulic oil to said fourth-speed attaining friction clutch.

4,506,564

AUTOMATIC TRANSMISSION CONTROL PRESSURE REGULATOR

Alan R. Coutant, Chillicothe, Ill., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 21, 1981, Ser. No. 295,032

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—869 **2 Claims**

1. In an automatic power transmission mechanism having multiple ratio gearing connecting drivably a driving shaft with a driven shaft;

friction clutch and brake means selectively engageable to establish various torque transmitting ratios in said gearing;

fluid pressure operated clutch and brake servos for actuating and releasing said clutch and brake means;

a positive displacement pump;

a control valve system for controlling pressure distribution from said pump to said clutch and brake servos including

a fluid pressure regulator valve assembly for maintaining a regulated circuit pressure level in said control valve system;

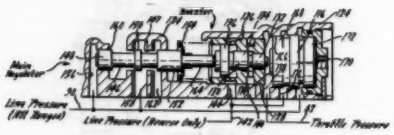
shift valve means for distributing selectively pressure from said regulator valve assembly to said servos;

a source of a speed pressure signal;

throttle valve means for producing a throttle pressure signal proportional in magnitude to engine torque;

means for distributing said signals to said shift valve means to effect ratio changes;

said throttle valve means being in communication with said



regulator valve means to effect an increase in the regulated circuit pressure level upon an increase in engine torque; and

booster valve means forming a part of said regulator valve assembly in communication with said throttle valve means for establishing a pressure force on said regulator valve means that compensates for a reduction in throttle pressure due to malfunctioning of the throttle valve assembly thereby maintaining a high threshold value for the regulated circuit pressure that is sufficient to maintain clutch and brake capacity and to avoid friction element slippage in said clutch and brake means.

4,506,565

CHAIN SAW AUTOMATIC SHARPENING METHOD AND ASSEMBLY

E. L. Potter, Charlotte, N.C., assignor to Textron, Inc., Providence, R.I.

Filed Jul. 29, 1982, Ser. No. 402,915

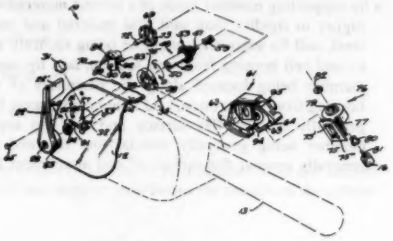
Int. Cl.³ B23D *63/16*

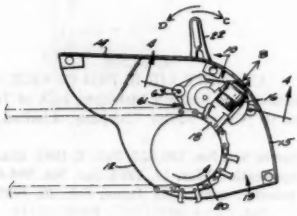
U.S. Cl. 76—25 A **22 Claims**

1. In a combination with a chain saw having a powered sharpenable chain, a chain sharpener assembly comprising:

a sharpening stone; and

means for effecting linear movement of said stone a predetermined stroke length toward and away from the chain to be sharpened so that in a first position thereof the stone is spaced from the chain, and in a second position thereof the stone operatively engages the chain; and for effecting





incremental adjustment of the spacing of a chain-distal portion of said stone from the chain in said first position.

4,506,566

CABLE FINISHING APPARATUS

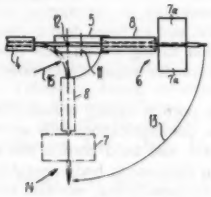
Hans Schmid, Rüschlikon, Switzerland, assignor to Megomat AG, Rüschlikon, Switzerland

Filed Nov. 28, 1983, Ser. No. 555,640

Claims priority, application Switzerland, Dec. 3, 1982, 7044/82

Int. Cl.³ H02G *1/12*

U.S. Cl. 81—9.51 **6 Claims**



1. A cable finishing apparatus comprising:

a first cable guide arranged along a predetermined cable path of travel along which a cable moves in a predetermined travel direction;

a pair of transport rolls arranged following the first cable guide in the predetermined direction of travel of the cable;

a gripper unit equipped with a pair of actuatable cable gripper elements arranged following the pair of transport rollers;

a second cable guide cooperating with said gripper unit;

means for mounting said gripper unit to be pivotable into a cable finishing position about a pivot axis arranged substantially at right angles to said cable path of travel;

a cable cutter unit arranged along the cable path of travel following said gripper unit;

said pair of transport rolls defining therebetween a nip;

said pivot axis of the gripper unit being located between an end of the first cable guide and said nip of said pair of transport rolls; and

means for enabling retraction of at least one of said transport rolls away from said cable path of travel.

4,506,567

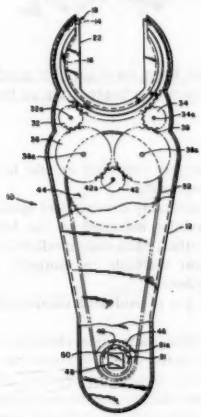
MAXIMUM CAPABILITY WRENCH

Samir B. Makhlouf, P.O. Box 543, Stony Brook, N.Y. 11790

Filed Mar. 7, 1983, Ser. No. 472,601

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.3 **3 Claims**



1. A hand held multi-torque wrench comprising an elongated housing, toothed jaw means mounted within said housing adjacent one end thereof floating rotationally, said end of said housing having a jaw opening for permitting access to said jaw means, a pair of spaced pinions within said housing for engaging the toothed elements of said jaw means, a pair of gears engaging said pinions, respectively, drive pinion means engaged to drive both of said gears, a chain driven element connected to rotate with said drive pinion means, external driving means within said housing adjacent the other end thereof, overruning clutch means within said driving means to permit ratchet operation of the latter upon being rotated by an external source of power with said housing stationary, and a chain drive between said driving means and said chain driven element, said hand held wrench being selectively operable as a wrench by rotating said housing or for torque multiplication with said housing stationary and rotational force applied to said driving means, said driving means including a toothed member having a power take-off extension, said toothed member containing said overrunning clutch means, the toothed elements of said toothed member engaging said chain drive, said power take-off extension terminating within said housing, said open jaw means being comprised of central and outer sections, said central section carrying the toothed elements and said outer sections having a diameter less than that of said central section, and insert means for fitting into the jaw opening of said jaw means to accomodate nuts of smaller size, each of said insert means being slotted for mating with the central and side sections of said jaw means.

4,506,568

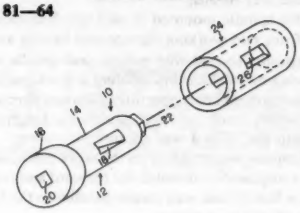
OIL FILTER WRENCH

Norman O. Aamodt, R.D. #5, Coatesville, Pa. 19320

Filed Jun. 16, 1983, Ser. No. 504,935

Int. Cl.³ B25B *13/52*

U.S. Cl. 81—64 **4 Claims**



1. A strap wrench adapted for use on oil filters comprising:

(a) a strap adapted to encircle a typical oil filter with its two ends being in a side-by-side relationship for a short distance; and

(b) a holder for the two ends of the strap in their side-by-side relationship, said holder having means adapted to be gripped with a wrench, said holder being in two parts comprising:

(1) a first part being a cylindrical part with a midregion and with means on at least one end thereof to be gripped with a wrench, said cylindrical part having a longitudinal axis and a slot which passes through the midregion of the cylindrical part perpendicular to the longitudinal axis;

(2) a second part being a cylindrical tube with opposite walls with a longitudinal axis and having an opening therein along the longitudinal axis with the opening being slightly larger than the size of the cylindrical part of the first part, said second part has a slot passing through both opposite walls thereof in its midregion perpendicular to the longitudinal axis;

(3) said first part being positioned within said second part with the slots therein being in alignment and the side-by-side ends of the strap being positioned to pass through said slots and draw the strap tightly around the oil filter; and

(4) the size of the slots are approximately equal to or slightly larger than the thickness of the two side-by-side strap ends and the width of the strap ends;

(5) said first and second parts coacting whereby rotation of the first part relative the second part locks the ends of the strap in the now misaligned slots of the first part and the second part; and

(6) said second part has a fulcrum arm projecting from the cylindrical part of the second part, said fulcrum arm functions as a means to engage the outside of the strap to press the inside of the strap against the side of the oil filter body and to allow for relative rotation between the first and second parts.

4,506,569

MULTIPLE AXIS SLANT BED MACHINE

Ivan R. Brown, Bressport; Paul M. Bjorck, Elmira Heights, and Brian M. Eaton, Elmira, all of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Nov. 2, 1982, Ser. No. 438,495

Int. Cl.³ B23B *3/00, 7/00, 17/00;* **F16C** *17/00*

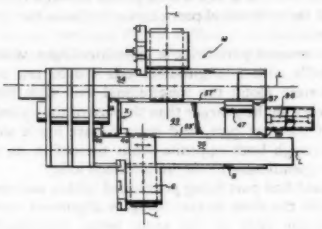
U.S. Cl. 82—2 R **17 Claims**

1. A multiple slide multiple axis machine, comprising:

(a) a machine tool bed including a ground supported generally horizontal surface and a working surface having first and second longitudinal spaced edges;

(b) at least two spaced apart parallel longitudinal way means disposed in said working surface, each of said way means including a pair of cooperating spaced parallel ways;

(c) a spindle mount fixedly attached to said bed and substantially spanning said working surface between said edges;
(d) said spindle mount including a forward substantially planar portion thereof generally transverse of and adjacent to said way means;
(e) a rotatable spindle mounted in said spindled mount at a distance from said working surface and having an axis of rotation parallel to said way means, said spindle adapted for receiving and detachably holding a work piece;
(f) at least two spaced apart apertures disposed through said spindle mount, each of said apertures longitudinally aligned with one of said way means;
(g) first tool means engageable with the work piece, said first tool means displacably mounted for forward and rearward motion in a first of said way means parallel to the longitudinal axes of said way means;
(h) first way cover means secured to said first tool means and displacable therewith and disposed between said two ways of said first way means for covering said first way means and adapted for passing through the aperture aligned with said first way means and thereby permitting said first tool means to be disposed closely adjacent said planar portion;
(i) first means for displacing said first tool means;



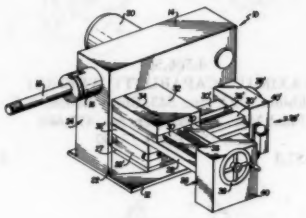
(j) second tool means engageable with the work piece, said second tool means displaceably mounted for forward and rearward motion in a second of said way means parallel to the longitudinal axes of said way means;
(k) second way cover means secured to said second tool means and displacable therewith and disposed between said two ways of said second way means for covering said second way means and adapted for passing through the aperture aligned with said second way means and thereby permitting said second tool means to be disposed closely adjacent said planar portion;
(l) second means for displacing said second tool means;
(m) control means operatively associated with each of said first and second means and adapted for permitting independent displacement and thereby operation of said first and second tool means;
(n) said displaceable way cover means each including longitudinal side portions received in said ways; and,
(o) fixed way edge portion cover means extending over and adjacent to said way cover means longitudinal side portions for retaining said displacable way cover means therebetween and thereby preventing chips from falling into said way means and under said way cover means and between said at least two spaced apart parallel longitudinal way means.

4,506,570

LATHE APPARATUS ESPECIALLY FOR BRAKE DRUMS AND DISCS

Charles L. Wood, 2439 Hoyt St., Winston-Salem, N.C. 27103, and Clarence E. Benton, 2466 Hallmark Dr., Florence, S.C. 29501

Filed Mar. 24, 1982, Ser. No. 361,406
Int. Cl.³ B23B *5/02*
U.S. Cl. 82—4 A **5 Claims**



1. A special purpose lathe, especially for machining an automotive component, such as a brake drum or brake disc, comprising:
a housing;
a power source;
spindle means rotatably mounted in said housing for supporting said component;
a drive motor for rotatably driving said spindle means;
a pair of slide modules mounted to the housing at right angles to one another, each slide module having a respective slide element shiftable in mutually perpendicular directions of movement;
means mounted to one of said slide elements for supporting a tool holder;
means associated with each slide element for selectively shifting the same in its respective direction of movement, said shifting means being independent of said spindle driving means, said shifting means comprising a servomotor mounted to each slide module and means for selectively connecting each servomotor to a respective slide element, each servomotor having an output shaft, said means for selectively connecting a servomotor to a slide element comprising a lead screw threadably engaged with the slide element, a first gear fixed to the lead screw, a second gear, means for non-rotatably fixing said second gear to the output shaft of the servomotor and for permitting axial sliding movement of said second gear along the output shaft and lever means engagable with said second gear for axially sliding said second gear into and out of meshing engagement with said first gear and means for resiliently biasing said second gear into meshing engagement with said first gear; and
switch means connected to said power source for selectively applying the power source to said drive motor and servomotors, said switch means having a first position wherein said power source is applied to said drive motor and only one of said servomotors and a second position wherein said power source is applied to said drive motor and only the other of said servomotors whereby simultaneous movements of said slide elements are prevented.

4,506,571

MACHINE FOR REMOVING BOOK BINDINGS

Robert Jensen, 9 Haylock Ct., Apt. 104, Baltimore, Md. 21236, and Richard Jensen, 3411 Lambros Rd., Baltimore, Md. 21234

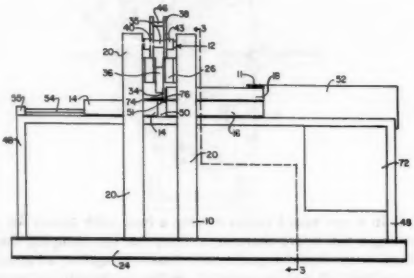
Filed Feb. 18, 1982, Ser. No. 349,784
Int. Cl.³ B26D *7/06*
U.S. Cl. 83—104 **24 Claims**

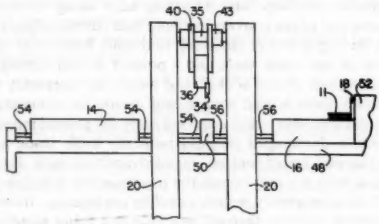
19. A cascade feeder and bound material chopping assembly

for use in severing the spine from the bound material, said assembly comprising:

at least first and second generally parallel reciprocatable decks, said first deck overlying said second deck and having a downwardly extending dam at a front edge thereof;

a cutter assembly having a reciprocatable cutter blade and a cooperating cutter stick, said second deck being movable to position a front edge of said second deck adjacent a first side of said cutter stick;





a third reciprocatable deck generally parallel to said first and second decks and having a front edge positionable adjacent a second opposed side of said cutter stick; and

means to reciprocate said decks so that the bound material which is placed on said first deck is fed to said cutter by movement of said first and second decks for severance of the spine from the bound material and further so that the spineless bound material is removed from said cutter by said third deck.

4,506,572

BOBBIN SEPARATING UNIT

Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

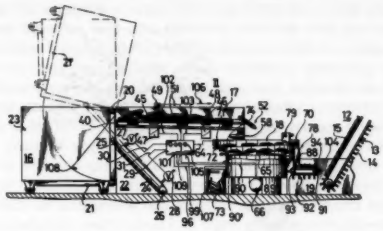
Filed Dec. 3, 1981, Ser. No. 327,037

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045824

Int. Cl.³ B26D *7/06*

U.S. Cl. 83—112 **10 Claims**

1. Bobbin separating unit, comprising a first charging device, a second charging device downstream of said first charging device in flow direction of the bobbins, a first separating device and a second separating device downstream of said first separating device, and means for controlling the bobbin delivery rate of said first charging and separating devices in dependence on the bobbin content of said second charging and separating devices, said second charging device being in the form of a flat bulk conveyor, said first separating device being



in the form of a rotary bulk conveyor, and said second separating device being in the form of an individual bobbin conveyor.

4,506,573

SHEARING MACHINE

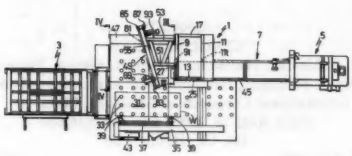
Chuo Tobita, Isehara, Japan, assignor to Amada Company, Limited, Isehara, Japan

Filed Dec. 28, 1982, Ser. No. 453,914

Claims priority, application Japan, Dec. 28, 1981, 56-193053

Int. Cl.³ B26D *7/18*

U.S. Cl. 83—153 **9 Claims**



1. A shearing machine comprising

(a) a work table

(b) a pair of upper and lower blades for cutting a work-sheet;

(c) feeding means for feeding the work-sheet onto the work table for cutting by the blades;

(d) scrap receiving means for receiving scrap cut from the work-sheet by the blades; and

(e) scrap removing means, positioned in front of the blades, for clamping and holding a piece of scrap from the work-sheet and for transporting the scrap to the scrap receiving means, wherein the scrap removing means is movable in a horizontal plane above the work table.

4,506,574

ZIGZAG FEEDER FOR BLANKING MACHINE

Hisateru Yamashita, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 12, 1964, Ser. No. 570,060

Claims priority, application Japan, Jan. 26, 1983, 58-008364[U]

Int. Cl.³ B26D *5/20*

U.S. Cl. 83—217 **2 Claims**

1. A feeder mechanism for feeding a sheet of metal to be blanked in a zigzag fashion in cooperation with a sheet of metal feed means of a press, comprising:

a die set of the press;

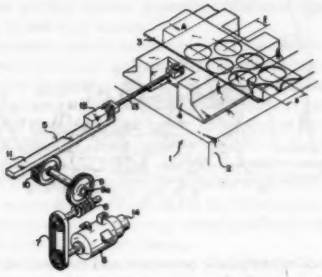
a rack connected to said press, said rack extending in a direction at right angles to the feed direction of the sheet of metal of the press;

a D.C. motor;

means for translating a rotational motion of said D.C. motor into a linear motion of said rack; and

controller means for controlling rotational direction of said

D.C. motor forwardly and reversely at a preset cycle thereby reciprocating said rack and said die set in a direc-



tion at right angles to the feed direction of the sheet of metal.

4,506,575

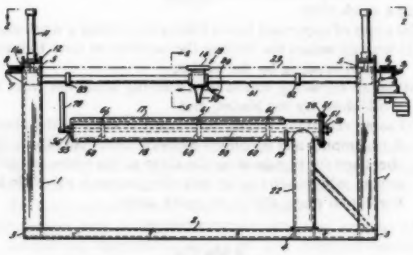
CORE SLABBER

Johnny A. McCay, Hartselle; Arthur H. Owens, Florence, and Jeffrey S. Pfaffman, Decatur, all of Ala., assignors to Champion International Corporation, Stamford, Conn.

Filed Aug. 26, 1983, Ser. No. 526,660

Int. Cl.³ B26D *3/00*

U.S. Cl. 83—368 **10 Claims**



1. A core slabbing device for removing the remaining layers of paper on the core of a mill roll, said core slabbing device comprising: a core carrier dimensioned to fit within and bear against the internal surface of the core; locking means for integrating the core with the core carrier; a blade carriage carrier aligned parallel to said core carrier and movable toward and away from said core carrier; a blade carriage slidably mounted on said blade carriage carrier for movement parallel to the axis of the core and the core carrier; a blade on said blade carriage; means for moving said blade carriage carrier toward and away from said core carrier; means for sensing and controlling the amount of amount of movement of the blade carriage carrier toward said core; and means for driving said blade carriage in a direction parallel to said core with the blade engaged with preselected layers of paper on said core to cut through said preselected layers on said core thereby enabling the removal of the paper.

4,506,576

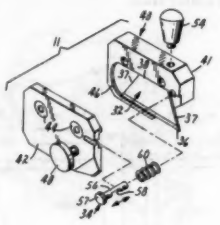
MAT BOARD CUTTER WITH KNIFE BLADE SECURING SAFETY PIN

Dennis L. Crawford, Roberts, Wis., and Donald J. Mitchell, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 7, 1983, Ser. No. 512,115

Int. Cl.³ B26D *7/02*

U.S. Cl. 83—455 **4 Claims**



1. In a mat board cutter having a base with means for positioning a mat board thereon; a clamp bar for clamping the mat board on said base; a guide rail on said clamp bar; a cutter-carrying body slideably mounted on the guide rail; at least one cutter assembly including a thin knife blade having a truncated pyramidal periphery with a cutting edge along its base and opposite end edges converging from said cutting edge, a pivot block having a socket receiving said knife blade with an end portion of said knife blade and a portion of said cutting edge projecting out of said socket, and means for releasably fixing said knife blade in said socket; and means for mounting said pivot block on said cutter-carrying body for pivotal movement between a disengaged position with the knife blade spaced from the mat board and an engaged position with the knife engaged with the mat board, the improvement wherein:

said cutter assembly includes a safety pin having a transverse groove opening through one side and being mounted on said pivot block for movement along a path through and transverse of said socket between a blocking position with said groove spaced from said socket and a portion of said pin positioned to engage the outer end edge of said knife blade to block movement of said blade out of said socket upon release of said means for releasably fixing, and a release position with said groove aligned with said socket to permit movement of said blade out of said socket upon release of said means for releasably fixing, and means for biasing said safety pin to said blocking position.

4,506,577

SLITTER APPARATUS

Tsutomu Shinomiya; Shigeki Mori, both of Sapporo, and Hiroshi Higuchi, Nagareyama, all of Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,568

Claims priority, application Japan, Sep. 16, 1982, 57-138921[U]

Int. Cl.³ B26D *1/24, 7/26*

U.S. Cl. 83—499 **3 Claims**

1. A slitter apparatus for slitting a sheet member such as a corrugated cardboard or the like into predetermined widths comprising:

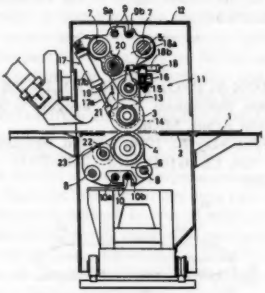
at least one pair of upper and lower rotary cutters and at least one pair of upper and lower shifters corresponding thereto being disposed above and below a conveying passage for the sheet member;

a pair of guide rods;

said pair of upper and lower shifters being operatively arranged to be moved slidably along on said respective guide rods by means of respective feeding screws;

said pair of upper and lower rotary cutters being selectively imparted with a predetermined shift movement;

at least one of the upper and lower rotary cutters being rotatably supported on one end portion of a supporting arm, and the other end portion of the supporting arm being in threaded engagement with a screw rod provided in parallel with the guide rods so that the supporting arm



may be swingable about the screw rod and also may be movable along the axial direction of the turning screw rod;

a first driving means being operatively mounted for swinging the supporting arm; and

a second driving means being operatively mounted for turning the screw rod.

4,506,578

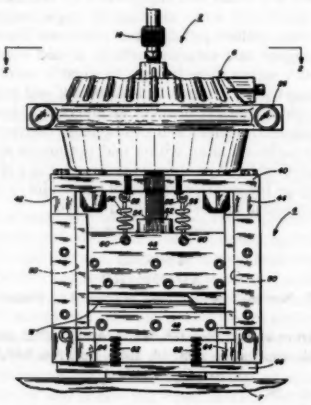
PNEUMATIC APPARATUS FOR ACTUATING METAL SHEAR

Harold S. Gaines, 1619 17th Ave., West, Bradenton, Fla. 33505, and Leonard C. Ross, 1270 E. 348th St., Eastlake, Ohio 44094

Filed Dec. 23, 1982, Ser. No. 451,531

Int. Cl.³ B26D *5/12*

U.S. Cl. 83—583 **1 Claim**



1. An apparatus for applying force to a work piece comprising a pneumatic cylinder mechanism having a flexible diaphragm therein, a piston member resiliently mounted interiorily of said cylinder such that the piston member is caused to move upwardly and downwardly in response to pneumatic force applied to said flexible diaphragm, valve control means for regulating the amount of fluid pressure exerted on said flexible diaphragm, said piston rod member extending exteriorly in pneumatic sealed relation through said cylinder and adapted to be operatively connected at its free end to a movable forming tool element, said movable forming tool element being movable toward and away from a second forming tool element for applying a work forming force to a work piece disposed between said tool elements, wherein said movable tool element is mounted for reciprocal movement on a support frame structure, and resilient means resiliently mounting said tool element on said support frame structure, wherein electric solenoid control valve means is pneumatically connected to said cylinder for electrically controlling the amount of pneumatic pressure applied to said flexible diaphragm member, wherein a sleeve member is disposed around said piston rod member interiorly of said cylinder for limiting downward movement of said piston rod member interiorly of said cylinder, and wherein said second tool element is movably mounted on a support frame structure, resilient means resiliently mounting said second tool element on said support frame structure.

4,506,579

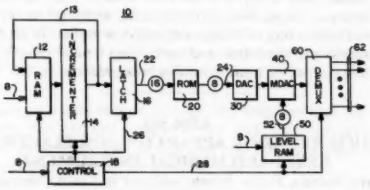
ELECTRONIC MUSICAL INSTRUMENT

David P. Rossum, LaSelva Beach, Calif., assignor to E-MU Systems, Inc., Santa Cruz, Calif.

Filed Apr. 18, 1983, Ser. No. 485,955

Int. Cl.³ G10H *1/46, 7/00*

U.S. Cl. 84—1.01 **5 Claims**



2. An electronic musical instrument comprising

first memory means for storing digital data representing one or more musical sounds where specified words of said digital data are allocated to respective storage locations in said first memory means in order to represent the respective musical sound when said respective digital words are read out of said respective storage locations in a multichannel time division multiplex format, and

control means for addressing first memory means for reading said digital data from said respective storage locations in said time division multiplex format, said control means including second memory means having first storage locations for storing first digital control words specifying the current address for each channel in said time division multiplex format to be addressed and second storage locations for storing second digital control words for specifying the remaining number of digital data words to be addressed for each channel in said first memory means in order to complete the musical sound to be generated.

4,506,580

TONE PATTERN IDENTIFYING SYSTEM

Tatsuhiro Koike, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 31, 1983, Ser. No. 462,181

Claims priority, application Japan, Feb. 2, 1982, 57-15210; Feb. 2, 1982, 57-15211

Int. Cl.³ G09B *15/04*; G10H *7/00*

U.S. Cl. 84—1.01 **19 Claims**

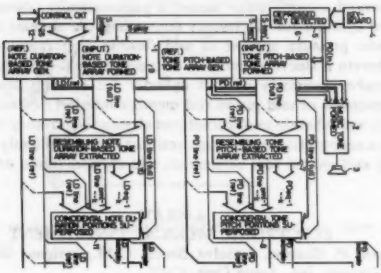
1. A tone pattern identifying system, comprising:

means for generating a tone array of successively located tone data serving as a reference theme;

means for externally inputting a tone array of successively

located tone data independent of the reference theme tone data; and

comparing means for collating the array of reference theme tone data with the array of inputted tone data by recognizing coincidence between the tone data in said reference



theme tone array and the tone data in said inputted tone array at respective corresponding locations in the arrays each time one of these two arrays is shifted in its position relative to the other, and outputting a most closely resembling array of tone data thus recognized.

4,506,581

TOUCH RESPONSE APPARATUS FOR ELECTRONIC KEYBOARD MUSICAL INSTRUMENT

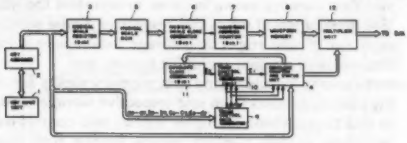
Takuya Sunada, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1983, Ser. No. 504,234

Claims priority, application Japan, Jun. 19, 1982, 57-105776; Dec. 8, 1982, 57-215179

Int. Cl.³ G10H *1/02, 1/34*

U.S. Cl. 84—1.1 **14 Claims**



1. A touch response apparatus for changing a sound characteristic of an output musical sound from an electronic keyboard musical instrument according to the depression speed of a performance key being operated, comprising:

a keyboard having a plurality of keys, each corresponding to respective different notes;

key depression detection means coupled to said keyboard and including a set of first and second switching means, each of said first and second switching means corresponding to each key of the keyboard and being switched in a predetermined order at the time of the operation of said each key;

key depression speed detection means coupled to said key depression detection means for detecting a depression speed of the key being depressed, and including:

a plurality of charge-and-discharge circuits smaller in number than the number of keys of said keyboard;

means for allotting the operated key to one of the plurality of charge-and-discharge circuits not being used, and for starting and stopping charging or discharging of said allotted charge-and-discharge circuits according to the switching operation of said first and second switching means; and means for producing an output signal corresponding to the charge of said allotted charge-and-discharge circuit; and

control means coupled to said plurality of charge-and-discharge circuits for controlling a sound characteristic of the output musical sound produced by the instrument as a function of the output signal of the allotted charge-and-discharge circuit.

4,506,582

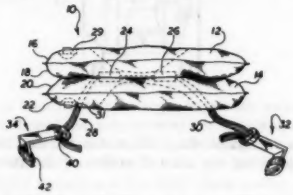
SHOULDER SUPPORT FOR VIOLIN OR VIOLA

Richard Goldner, Bellingham, Wash., assignor to Shar Products Company, Ann Arbor, Mich.

Filed May 30, 1984, Ser. No. 615,430

Int. Cl.³ G10D *3/18;* **G10G** *5/00*

U.S. Cl. 84—280 **14 Claims**



1. A shoulder support for violin or viola comprising:

a first pliable, inflatable chamber having an air inlet and exhaust means and first and second expandable surfaces sealed together about their outer periphery;

means secured to at least one of said expandable surfaces for retaining an attachment strap thereto; and

attaching means including a pliable, elongatably resilient attachment strap attached to said retaining means, said attachment strap including at each of its ends an angular engagement member adapted to engage the exterior surface of said violin or viola to secure said shoulder support thereto and retain said engagement by resilient tension of said attachment strap, said angular engagement members including resilient pad members positioned thereon to face and engage said exterior surfaces of said violin or viola and slot means therethrough to slidably receive said attachment strap, wherein at least one of said pad members on each of said engagement members is slidable on said engagement member and positionable thereon to secure said attachment strap within said slot means at an adjustable desired fixed position while presenting a resilient face to engage the exterior surface of said violin or viola when said shoulder support is secured thereto.

4,506,583

AUTOHARP

William T. Newton, 6412 Green Valley Rd., Knoxville, Tenn. 37914

Continuation of Ser. No. 380,541, May 21, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 619,705

Int. Cl.³ G10D *1/12*

U.S. Cl. 84—287 **8 Claims**

1. A multi-stringed Autoharp wherein all of the strings are normally dampened, and are selectively undampened during playing of the Autoharp by a keyboard, said autoharp comprising:

a hollow resonator box having a top side and a first and second end;

a multiplicity of sounding strings secured parallel to each other across said resonator box at said first and second ends and at a selected spacing above said top side, said multiplicity of strings tuned to provide notes arranged in a plurality of octaves;

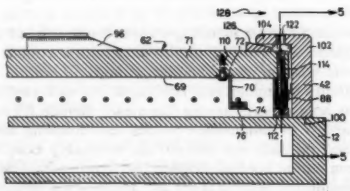
a pair of support means mounted to said resonating box parallel to said multiplicity of strings, each one of said pair defining twelve equally spaced octave bar channels, and said pair being mounted so that said multiplicity of parallel strings are located between said parallel pair of support means such that each of said twelve channels of one of said pair opposes one of said channels in the other one of said pair;

twelve parallel octave bars, one each for each note in a standard octave and each octave bar including,

a longitudinal portion having first and further ends and a top side and a bottom side, each of said first and further ends defining a threaded aperture extending through said longitudinal portion from said bottom side to said top side, and being supported by and extending between each of said pair of said support means such that said longitudinal portion is located above and perpendicular to said strings, and such that said first and further ends extend within one of said channels defined in one of said pair of support means and said opposing channel of said other one of said pair to maintain said octave bars parallel to each other,

a key or finger contact portion rigidly attached to said top side of said longitudinal portion,

a plurality of control members rigidly attached to said bottom side of said longitudinal portion and equal in number to the number of octaves containing said selected note,



each of said control members extending from said bottom side of said octave bar through said strings to a dampening portion located below a string corresponding to said note,

a plurality of dampening pads, one each attached to one each of said control members between said control member and said string, and adapted to dampen a vibrating string,

one each of said longitudinal portion, finger contact portion and plurality of control members all operating together as a single rigid unit and comprising each of said octave bars;

twelve pairs of resilient members, one each of each of said pairs located in opposing channels defined in said pair of support means, and each one of said pair of resilient members cooperating with one each of said twelve octave bars, and operating to maintain said pads of an octave bar in a rest position against said sounding strings associated with the notes of said octave bar when said contact portion of said octave bar is not depressed and said octave bar is in its rest position, and such that said pads are moved to a playing position spaced from said strings by depressing said contact portion so as to move said octave bar to allow said string to vibrate when said note associated with said string is to be played, and said playing position of said octave bar being substantially parallel to said rest position; and

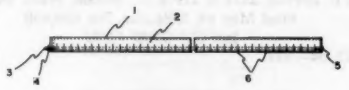
an adjustable stop screw received by each of said threaded apertures for adjusting the distance said dampening pads can be spaced from said strings.

4,506,584

METHOD OF MANUFACTURE OF WARP-RESISTANT NECKS FOR STRINGED INSTRUMENTS

Tony D. Oakley, Rte. 1, Box 109, Timberlake, N.C. 27583

Filed May 16, 1983, Ser. No. 494,714
Int. Cl.³ G10D *3/00*
U.S. Cl. 84—293 **8 Claims**



1. A method for assembling the neck of a stringed musical instrument so as to prevent stress distortion thereof comprising:

providing a longitudinally extending opening along the length of the neck of said instrument, said opening being substantially centrally located in the width of the neck of the instrument,

fixedly and securely disposing within said opening a longitudinally extending hollow torsion rod of a cross-sectional shape complementarily associated with said opening, wherein said rod has a cross-sectional shape consisting of a flat upper surface located nearest the fretboard and a non-circular underside, wherein said torsion rod has a number of transverse slits provided along the length of the underside thereof, said slits extending from the bottom of said rod more than one-half the vertical depth of said rod, and

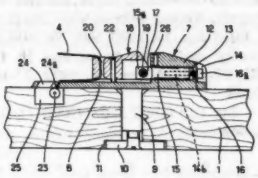
providing a bar extending through the length of said rod and below the vertical center of said rod, said bar securely held against one end of said rod and having a tightening means provided on the opposite end of said rod.

4,506,585

STRINGED INSTRUMENT

Jean-Luc Desmond, 2, Impasse Margueriteau, 94150 Chevilly Larue, France

Filed Mar. 23, 1983, Ser. No. 477,988
Int. Cl.³ G10D *3/04*
U.S. Cl. 84—298 **17 Claims**



1. A stringed musical instrument comprising a body over which are stretched substantially parallel strings, each string being stretched between a tuning key disposed at one end of the instrument and an area substantially in line with a bridge-tailpiece assembly mounted on the body of the instrument, the bridge-tailpiece assembly comprising a plate attached to said body and, for each string, a respective adjustment member mounted on said plate, characterized in that each adjustment member comprises a first element movable in translation relative to the plate in a direction substantially parallel to the direction of the corresponding string and a second element, attached to but pivotable relative to the first element, which may be oriented relative to the plate of the bridge-tailpiece assembly by virtue of a positioning device and which comprises a bore through which the corresponding string passes, said string being hooked onto the body at a point such that the

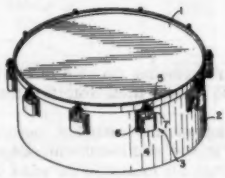
string bears on the second element over substantially the entire length of the aforementioned bore and that the positioning device is pushed by the tension of the string on the body or a piece integral with the body.

4,506,586

QUICK RELEASE DRUM HEAD RESTRAINT

Lewis E. Brewer, 2514 S. 219th St., Seattle, Wash. 98188

Filed May 14, 1984, Ser. No. 609,650
Int. Cl.[3] G10D *13/02*
U.S. Cl. 84—413 6 Claims



1. In a drum having a drum body and a drum head, said drum head having a rim holding a drum skin in tension over said drum body, a restraining device securing said drum head to said drum body, said restraining device comprising:

a rod attached to said drum head at one end and to a pendulum at the other end, said pendulum having a bushing defining a sliding surface, wherein the length of said rod between said drum head and said pendulum is adjustable to tune said drum; and

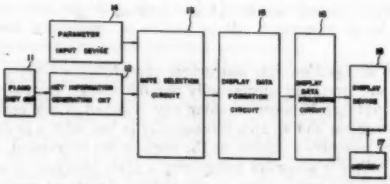
a toggle unit pivotally attached to said drum body to engage said pendulum, said toggle unit having a cavity for receiving said pendulum, said cavity having a ramp portion which slidably receives said bushing when said pendulum is received in said cavity to secure said drum head to said drum body, wherein the length of said rod between said drum head and said pendulum is not changed when said toggle unit is moved in and out of engagement with said pendulum.

4,506,587

METHOD OF PROCESSING DATA FOR MUSICAL SCORE DISPLAY SYSTEM

Kazurou Tanaka, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 15, 1983, Ser. No. 504,395
Claims priority, application Japan, Jun. 18, 1982, 57-104719; Jun. 23, 1982, 57-107838; Jun. 23, 1982, 57-107839; Jun. 25, 1982, 57-109268
Int. Cl.[3] G10G *3/04;* G09B *15/02*
U.S. Cl. 84—462 5 Claims



5. A musical score display system for a keyboard musical instrument comprising:

means for determining, for each successively depressed key, the duration for which each such key was depressed, and

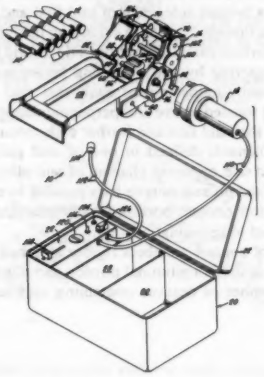
means for visually displaying note symbols for each depressed key, the visual spacing between the displayed note symbols for successively depressed keys corresponding to the duration for which each such key was depressed, independent of the time period between depression of consecutively depressed keys.

4,506,588

AMMUNITION HANDLING SYSTEM AND METHOD

Robert P. Kazanjy, Santa Ana, Calif., assignor to Western Design Corp., Irvine, Calif.

Filed Dec. 13, 1982, Ser. No. 449,154
Int. Cl.[3] F41F *9/02*
U.S. Cl. 89—34 13 Claims



1. An ammunition handling system for storage of ammunition rounds and feeding of the ammunition rounds into an automatic weapon magazine comprising:

a plurality of ammunition holding strips, each said ammunition holding strip having clip means thereon for holding a plurality of ammunition rounds, and coupling means disposed on each end thereof for releasably coupling said ammunition holding strips to one another for feeding said ammunition holding strips and ammunition rounds into an ammunition stripper and loader assembly;

a separate manually transportable and portable storage container; and,

an ammunition stripper and loader assembly sized for storage in said manually transportable and portable storage container comprising:

(a) load chute means for supporting at least one said ammunition holding stirp,

(b) means for separating said ammunition rounds from said ammunition holding strips into separated ammunition rounds, and

(c) means for feeding the separated ammunition rounds into an ammunition transfer unit of an automatic weapon.

4,506,589

FIRING MECHANISM FOR AUTOMATIC FIREARM

Ralph D. Junker, Columbus, N.C., and James R. Helms, Landrum, S.C., assignors to Junker Systems, Inc., Tryon, N.C.

Filed Oct. 6, 1982, Ser. No. 433,082
Int. Cl.[3] F41D *3/00*
U.S. Cl. 89—190 10 Claims

1. A firearm comprising:

housing means defining a barrel bore, an ignition chamber communicating with a rear end of said bore, and a shoulder arranged to terminate forward travel of a projectile in said ignition chamber,

bolt means slidable along a fore-aft axis in said ignition chamber and including a striker projection for displacing the projectile into a firing position against said shoulder, a forward stroke of said bolt means being of such length that

said bolt means and said striker projection continue to travel after the projectile is stopped by said shoulder so that said striker projection ignites a primer of the projectile in response to further forward movement of said bolt means against the stopped projectile,

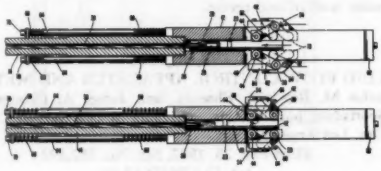
means for advancing said bolt means comprising:

arm means having a first end mounted on said bolt means for rotation such that a second end of said arm means is movable laterally inwardly relative to and toward said fore-aft axis,

a boss carried at said second end of said arm means,

an actuator member being movable in said fore-aft direction and including:

a first cam surface inclined at an acute angle relative to said fore-aft axis for urging said boss forwardly and laterally inwardly against a side of said housing means rearward of said shoulder to advance said boss



and said bolt means forwardly, said boss being movable laterally inwardly along said first cam surface in response to said boss becoming aligned with a lateral groove in said side of said housing means such that said first end of said arm means is moved forwardly to push said bolt means and its striker projection forwardly to ignite the projectile, and

a stop surface extending rearwardly from an end of said cam surface, and

means urging said actuator member forwardly for:

pushing said boss and bolt means forwardly to shift the projectile to said firing position,

camming said boss laterally inwardly into said groove to further displace said bolt means forwardly and ignite the primer, and

moving said stop surface into blocking relationship with said boss to block movement of said boss out of said groove.

4,506,590

HYDRAULIC ROTARY ACTUATOR

Masayuki Miki, Otsu, and Tetsuya Tanigaki, Kyoto, both of Japan, assignors to Shimadzu Coporation, Kyoto, Japan

Filed Jul. 21, 1983, Ser. No. 515,604

Claims priority, application Japan, Jul. 28, 1982, 57-132655; Jul. 30, 1982, 57-134192; Sep. 24, 1982, 57-166361

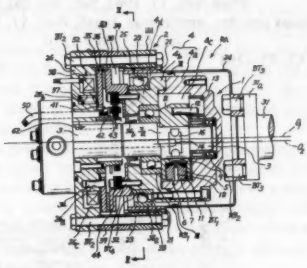
Int. Cl.[3] **F15B** *21/02;* **F01B** *1/06, 13/06*

U.S. Cl. 91—35 **11 Claims**

1. A hydraulic rotary actuator comprising:

(a) a harmonic drive comprising a generally hollow cylindrical rigid circular spline closed at one axial end by a supporting member and open at the opposite end, with internal teeth formed on said open axial end portion of said rigid spline, a generally cup-shaped flexible spline having external teeth on one axial end thereof and an output shaft fixed to the opposite axial end thereof so as to extend in the axial direction opposite to said one axial end, said flexible spline having said one axial portion inserted into said opposite axial end portion of said rigid circular spline so that said rigid and flexible splines define a closed chamber, and a wave generator so arranged in said chamber as to act on said flexible spline to cause partial engagement of said external and internal teeth;

(b) a hydraulic motor of a radial piston type arranged in said chamber, and having a rotatable motor casing the axial end portion of which has an elliptical circumference with said wave generator being mounted on said elliptical end portion of said hydraulic motor casing so that as said motor is rotated, said wave generator causes the points of engagement of said internal and external teeth of said two splines to be displaced circumferentially;



(c) a detector so arranged in said chamber in associated with said hydraulic motor as to detect the angular position or speed of said hydraulic motor relative to said rigid circular spline; and

(d) an electromagnetic brake so arranged in said chamber as to act on said hydraulic motor.

4,506,591

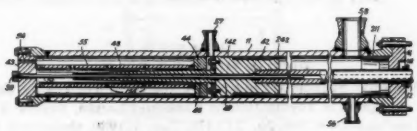
OCEAN FLOOR DREDGE SYSTEM HAVING A PNEUMOHYDRAULIC MEANS SUITABLE FOR PROVIDING TRIPPING AND HEAVE COMPENSATION MODES

James Blanchet, Arlington, Wash., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Division of Ser. No. 147,151, May 6, 1980, Pat. No. 4,382,361. This application Sep. 27, 1982, Ser. No. 424,048

Int. Cl.[3] **F01B** *11/02;* **F15B** *15/22*

U.S. Cl. 92—85 B **7 Claims**



1. A hydraulic system designed to provide damping, the system comprising:

an enclosed cylinder, and upper and lower end caps for the upper and lower ends of the cylinder, respectively;

a piston head slidably sealably movable within the cylinder;

a piston rod secured to one end of the piston and extending sealably through one end cap;

a tapered elongated piston spear extending upwardly from the upper end of the piston towards the upper end cap, the diameter of the spear decreasing in an upward direction;

an interior partition extending across the cylinder and located between the piston head and the upper end cap, the partition having a central aperture concentric with the spear and having a diameter slightly greater than the greatest diameter of the spear, such that an annular opening of gradually smaller area is provided as the piston head approaches the interior partition;

fluid flow means for providing hydraulic liquid to the lower portion of the cylinder, between the piston and the lower end cap; and liquid level means to provide and maintain

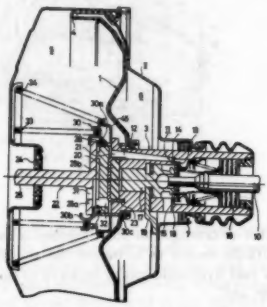
hydraulic liquid within the upper portion of the cylinder to a predetermined height above the piston head.

4,506,592

BRAKE POWER SERVO BOOSTER

Morihiko Shimamura, Saitama, Japan, assignor to Jidosha Kiki Co., Ltd., Japan

Filed Nov. 17, 1983, Ser. No. 552,879
Claims priority, application Japan, Nov. 17, 1982, 57-201687
Int. Cl.³ F16J 1/10
U.S. Cl. 92—101 **2 Claims**



1. A brake power servo booster in which a fluid pressure difference is generated between opposite sides of a power piston so as to cause said power piston to advance by said pressure difference, wherein the advancing force is transmitted to an output shaft, wherein said output shaft comprises at least two members with a wedge-shaped recess formed between said at least two members and a wedge member is pressed into said wedge-shaped recess by said power piston when said power piston is caused to advance, thereby causing the distance between said at least two members to be enlarged;

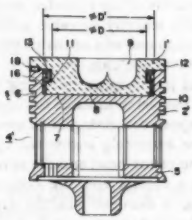
wherein said wedge member comprises an annular elastic member having a plurality of circumferentially equidistant recesses formed at its outer peripheral surface, and a plurality of balls located in respective ones of said recesses.

4,506,593

PISTON HEAD STRUCTURE

Masahiko Sugiyama, and Kenichi Nishio, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 212,420, Dec. 3, 1980, abandoned. This application Jan. 21, 1983, Ser. No. 460,022
Claims priority, application Japan, Dec. 19, 1979, 54-164076; Apr. 9, 1980, 55-46474
Int. Cl.³ F16J 1/04
U.S. Cl. 92—212 **9 Claims**



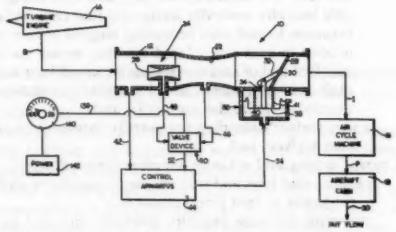
1. A piston head structure for an engine wherein a ceramic piston head is firmly secured to the top portion of a piston body, characterized in that a metallic ring, which is formed of two semicircular portions and has a radially inward projection projected from the inner peripheral surface thereof, is radially inwardly fitted at an upper portion thereof to an annular groove formed at a lower part of said ceramic piston head and that said ceramic piston head fits tightly in a radially outward direction within an annular wall in a recess formed in the top portion of said piston body, all radial communication between said lower part of said ceramic piston head and said annular wall in said recess formed in the top portion of said piston body being achieved, exclusively through the medium of said metallic ring which is engaged with said annular wall in said recess in the top portion of said piston body to prevent the ceramic piston head from separating from the piston body when the engine is operated, a lowermost surface of said ceramic piston head engages in direct contact with a bottom wall in said recess, and an upper part of said ceramic piston head extends radially outward over said metallic ring and approximately coextensively with said piston structure which surrounds said annular wall of said recess.

4,506,594

FLUID FLOW CONTROL APPARATUS AND METHOD

Charles M. Rowland, Phoenix, and James A. Denneny, Jr., Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 25, 1982, Ser. No. 352,392
Int. Cl.² B64D 13/00
U.S. Cl. 98—1.5 **24 Claims**



1. A flow control for admitting air from an air pressure source to a cabin at a controlled rate comprising: a duct through which a flow of said air is conducted from said source to said cabin, first and second flow sensing means for sensing said flow of air through said duct to produce respective first and second signals analogous to said air flow, said first and said second flow sensing means producing said first and said second signals as differing analogs of said flow, means for blending said first and said second signals in response to an operator input to produce a third signal, and valve means opening and closing said duct in response to said third signal.

4,506,595

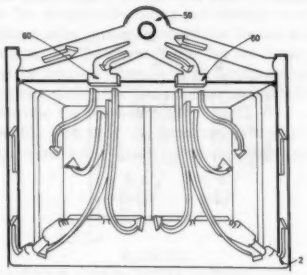
MODULAR WALL AND CEILING SYSTEM

Graham S. Roberts, 24 Church Hill, Camberley; David T. Smith, "Rudwicks" Rudwicks Close, Felpham, Bognor Regis, and Brian J. Woolsey, "Sunnyside", Surbiton Golf Course, Woodstock La., S. Chessington, all of England

Filed May 21, 1982, Ser. No. 380,706
Claims priority, application United Kingdom, May 26, 1981, 8115964
Int. Cl.³ F24F 7/10
U.S. Cl. 98—31 **13 Claims**

1. In a room construction for maintaining a sterile environment comprising a plurality of ceiling panels, a plurality of wall panels having a double wall construction with an air space existing between opposite walls thereof, and means connecting the wall panels together at upstanding marginal regions thereof, the wall panels including thereamong a plurality of

panels each having in a lower region thereof at least one aperture thereinto from the room interior communicating the room interior with the interior of the panels and means in an upper regions thereof for communicating the interiors of the respective panels with extraction ducts, the wall panels being coved at their base edges to provide a rounded surface transition from wall to floor within the room, the improvement comprising including as said wall panels, wall panels moulded as a single element from synthetic plastics material in a double skin con-



struction with opposite walls joined at their upstanding edges and forming said wall panel connecting means at connections between in-line panels as single walled moulded panels of synthetic plastics material having coving at their base edges connected to the said wall panels on either side thereof to provide a surface continuous with that of the panels which they join at substantially all positions over the height thereof at least up to ceiling level and to provide therebehind service ducts for supply of services to the exterior of the wall comprised thereby.

4,506,596

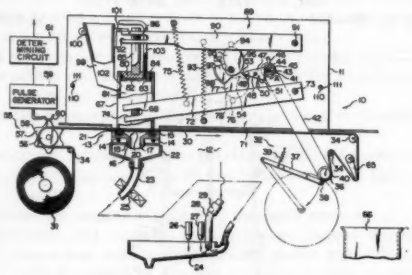
BEVERAGE BREWING APPARATUS

Hiromichi Shigenobu; Takao Nakabayashi, both of Maebashi; Kitio Akiyama, Fujioka; Masao Miida, Numata, and Hisashi Karasawa, Takasaki, all of Japan, assignors to Toshiba Electric Appliances Co., Ltd., Maebashi, Japan

Filed May 29, 1984, Ser. No. 614,556

Int. Cl.³ A47J *31/36*

U.S. Cl. 99—289 T **11 Claims**



1. An apparatus for extracting a beverage solution by brew, comprising:

a base,

a stage attached to the base and having a stage surface with a brewing hole, the brewing hole being covered with a rigid sheet member having a number of perforations and substantially flush with the stage surface;

an elongate filter tape capable of traveling over the stage surface of the stage and the sheet member;

filter tape driving means for intermittently driving the filter tape by inches, thereby intermittently locating new parts of the filter tape on the stage surface and the sheet member;

a hollow brewing cylinder disposed on the stage surface side of the stage and having an axis perpendicular to the stage surface, at least one end of the brewing cylinder nearer to the stage being open;

brewing cylinder moving means adapted to move the brewing cylinder axially, thereby bringing the open end of the brewing cylinder into liquid-tight contact with the stage surface with the filter tape therebetween so that the open end surrounds the brewing hole, and separating the open end of the brewing cylinder at a predetermined distance from the stage surface;

a pressurizing piston slidably disposed in the brewing cylinder and designed so that a brewing chamber is defined inside the brewing cylinder by the inner wall surface of the brewing cylinder, the pressurizing piston, and the filter tape when the open end of the brewing cylinder is in liquid-tight contact with the stage surface through the medium of the filter tape;

piston moving means for axially moving the pressurizing piston in the brewing cyljnder;

material powder supply means for feeding a predetermined quantity of material powder as material for the beverage solution into the brewing chamber defined inside the brewi...g cylinder; and

hot-water supply means adapted to supply the brewing chamber with hot water pressurized to a predetermined pressure when the material powder is fed into the brewing chamber and pressurized by the pressurizing piston.

4,506,597

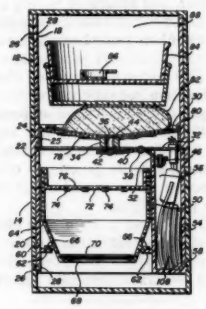
DRIP COFFEE MAKING KIT

Albert L. Karns, 2218 Brownell, and Robert M. Jennings, 1907 E. 20th, Box 2095, both of Joplin, Mo. 64801

Filed Oct. 31, 1983, Ser. No. 547,651

Int. Cl.³ A47J *31/10*

U.S. Cl. 99—295 **10 Claims**



1. A drip coffee making kit including upper and lower downwardly and upwardly opening closure caps and an upstanding tubular body over whose upper and lower ends said upper and lower closure caps are removably snugly telescoped and releasably secured to provide a unitary, closed and readily portable assembly, said body including a mid-height partition having a a central opening therein, electrical resistance heating means in said body for heating liquid disposed therein above said partition, valve means for opening and closing said drain opening, one side of the body below said partition having an access opening therein, an upwardly opening filter basket, said filter basket being receivable inwardly and outwardly through said opening and said body and basket including coacting means for removably supporting the basket within said body below said

partition and in registry with said drain opening, and said body and lower cap being of a non-circular plan shape, whereby the lower end of said body and said lower cap may be relatively angularly displaced after separation of said lower cap from the lower end of said body for support of the body lower end from the upper open end of said lower cap and drainage of liquids from said basket into said lower cap.

4,506,598

APPARATUS FOR THE HEATING OF FOODSTUFFS BY MEANS OF A STEAM-AIR MIXTURE

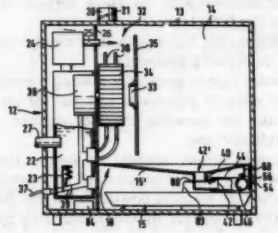
Siegfried Meister, Iglinger Strasse 62, 8910 Landsberg/Lech, Fed. Rep. of Germany

Filed Jan. 20, 1982, Ser. No. 341,192

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1981, 8131827[U]

Int. Cl.³ A47J *27/04*

U.S. Cl. 99—330 **10 Claims**



1. Apparatus for the heating of foodstuffs with a steam or air heating medium comprising:

a cooking chamber (**14**) receiving the foodstuff for being heated by the heating medium, said cooking chamber having a controllable vapor vent (**20**) and an outlet (**40**) through which the steam heating medium can escape only after the chamber is filled with the steam heating medium;

a steam generator (**22**) for supplying steam heating medium to said chamber, said generator having a regulatable heating element (**23, 82**) controlling the generation of steam;

means (**34**) for circulating said heating medium in said chamber;

heating means (**38**) within said cooking chamber for heating the heating medium in said chamber;

a sensor (**80**) operatively associated with said cooking chamber outlet (**40**) and coupled to said regulatable heating element (**23, 82**) of said steam generator (**22**) for controlling said element and the generation of steam responsive to the presence of steam at said outlet (**40**);

a fat collection pan (**15**); and

said outlet (**40**) including a drain pipe (**44**) for water condensed out of the steam at said outlet, said drain pipe having an opening (**64**) over said fat collection pan (**15**) for draining food substances into said pan (**15**).

4,506,599

DEVICE FOR REMOVAL OF ETHYLENE FROM FRUIT STORAGE CHAMBERS

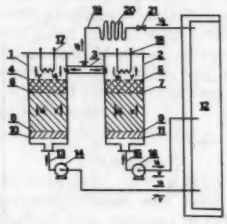
Jerzy Wojciechowski; Jerzy Haber, both of Cracow; Zygmunt Gozdziewicz, Kedzierzyn-Kozle, and Edward Lange, Skierniewice, all of Pland, assignors to Polska Akademia Nauk, Instytut Katalizy I Fizykochemii Powierzchni, Cracow, Poland

Filed Dec. 20, 1983, Ser. No. 563,408

Int. Cl.³ A23B *7/00*

U.S. Cl. 99—469 **2 Claims**

1. A system for removal of ethylene from fruit storage chambers by means of catalytic combustion of ethylene and the closed circulation of gas through the system, comprising two catalytic reactors connected with a storage chamber and further connected therebetween with collector means for transporting gases between said reactors and for transmitting a portion of said gases to said storage chamber, each reactor being provided in the upper part thereof with electric heating means, a combustion catalyst bed, packing material of weak heat conductivity disposed beneath said catalyst bed, and metallic packing material of good heat conductivity disposed beneath said aforesaid packing material, separate conduit means for connecting the lower portion of each reactor to said storage chamber, and fan means within each said conduit



means for alternate and reversible operation to conduct gas to and from said storage chamber, and a further conduit means connecting said collector means to said storage chamber, said further conduit means being provided with heat exchange means for cooling by air, at ambiant temperature, gases returned through said further conduit to said storage chamber, and valve means disposed in said further conduit for regulating the flow of gas from said collector means to said storage chamber such that the ratio of the volume of gas removed from said storage chamber to the volume of gas returned to said chamber is from about 10–100:1.

4,506,600

CANNING APPARATUS

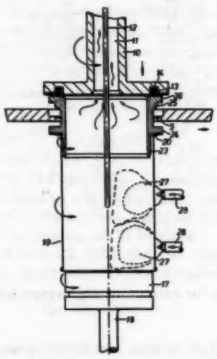
Albert C. Hersom, Beaconsfield; Kenneth W. Wright, Twyford, and John E. Brittain, Penn, all of England, assignors to Nestec, S.A., Vevey, Switzerland

Division of Ser. No. 312,957, Oct. 20, 1981, Pat. No. 4,419,376. This application Aug. 18, 1983, Ser. No. 509,417

Claims priority, application United Kingdom, Nov. 14, 1980, 8036671

Int. Cl.³ A23L *3/16*; B65B *1/10*

U.S. Cl. 99—474 **18 Claims**



1. An apparatus for treating a solid particulate foodstuff in a container having an open end which comprises:

(a) means for supporting the container;

(b) a hollow extension piece;

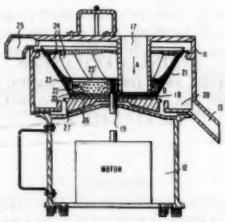
(c) means for temporarily engaging the extension piece with the container so that the interior of the extension piece communicates with the interior of the container and the extension piece and container cooperatively define a hollow assemblage;
(d) means for introducing particles of the foodstuff into the assemblage so that the particles fill the container and at least partially fill the extension piece and so that there are interstices between the particles;
(e) a closing member;
(f) means for temporarily fitting the closing member to the assemblage after introduction of the foodstuff to form a closed assembly having an outlet for the escape of air;
(g) means for purging steam through the interstices between the particles within the closed assembly until the foodstuff subsides into the container; and
(h) means for separating the container, extension piece and closing member from each other after steam purging.

4,506,601

JUICE EXTRACTOR WITH AUTOMATIC PULP DISCHARGE

Justo F. Ramirez, and Justo D. Ramirez, both of Garibaldi 1385, Guadalajara, Jal. C. Postal 44660, Mexico

Filed May 12, 1983, Ser. No. 493,889
Claims priority, application Mexico, May 17, 1982, 192713
Int. Cl.³ A23N *1/00*
U.S. Cl. 99—511 **12 Claims**



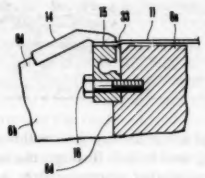
1. A juice extractor for juicing a fruit or vegetable product and separating a liquid portion of a fruit or vegetable product from a solid portion thereof comprising a base,
a motor means mounted on the base for rotating a spindle,
a cutting disk associated with the spindle for positive rotation of the cutting disk,
means for introducing the product to be juiced to the cutting disk,
rotatable foraminate means for retaining the solid portion of the product and allowing the liquid portion to pass outwardly,
collection means for collecting the liquid portion,
rotatable and movable pulp discharge control means in association with said foraminate means and defining a surface capable of exerting pressure on pulp located in said foraminate means, to thereby maximize extraction of juices and to control the flow of pulp from the foraminate means,
said movable pulp discharge control means comprising a cylindrical base having attached thereto a plurality of flexible vanes oriented in an upward direction and with adjacent vanes in overlapping relation and defining a complete circle of vanes, which upon action by centrifugal force will expand in an outwardly direction and thereby decrease the overlapping relation of adjacent vanes.

4,506,602

IMPRESSION CYLINDER DEVICE OF SHEET-FED PRINTING PRESS WITH TURN-OVER MECHANISM

Hiroyuki Sugiyama, Toride, and Masaaki Ishida, Ryugasaki, both of Japan, assignors to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,349
Claims priority, application Japan, Jul. 23, 1982, 57-128477
Int. Cl.³ B41F *21/04*
U.S. Cl. 101—230 **3 Claims**



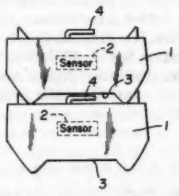
1. In a sheet-fed printing press provided with a turn over mechanism in which a trailing end of a sheet of paper, wrapped about an impression cylinder, and gripped by a gripper mechanism carried by said impression cylinder, is sucked by a suction device of a turn-over cylinder in contact with said impression cylinder and transferred from said suction device and gripped by the turn-over grippers of said turn-over cylinder to be turned over, the improvement which comprises an orifice at an interface between a paper clamping surface of a gripper support cooperating with said impression cylinder gripper and a peripheral surface of said impression cylinder, said orifice being formed in said gripper support of said impression cylinder, means for connecting said orifice to a source of air and means for supplying air to said orifice in timed relation to actuation of said turn-over grippers to release said sheet and to separate said released end of said sheet from said impression cylinder.

4,506,603

ARRANGEMENT FOR A LAND MINE

Sven Bjelvert; Göran Olofsson, and Per Nyström, all of Eskilstuna, Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Feb. 18, 1983, Ser. No. 467,838
Claims priority, application Sweden, Feb. 22, 1982, 8201069
Int. Cl.³ F42B *23/00*
U.S. Cl. 102—401 **3 Claims**



1. Arrangement for a land mine (1) designed to be placed in the ground, the mine being provided with at least one magnetic field sensing device (2) which is arranged to initiate detonation of the mine when a change in the magnetic field is sensed, characterised by a magnetic body loosely laid underneath the mine (1), as a result of which the removal of the mine from the ground results in the mine being removed from the magnetic body, so that a change in the magnetic field which initiates detonation of the mine is sensed by the magnetic field sensing device (2).

4,506,604

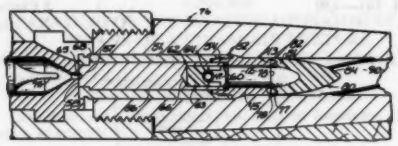
CARTRIDGE SHAPED BARREL INSERT

Jack Hughes, P.O. Box 275 Thrall Rd., Ellensburg, Wash. 98926

Continuation-in-part of Ser. No. 307,741, Oct. 2, 1981, Pat. No. 4,418,488. This application Jun. 17, 1983, Ser. No. 505,287

Int. Cl.³ F41C 21/10; F42B 5/22, 9/20

U.S. Cl. 102—446 9 Claims



1. A cartridge insert for firing a small bore rimfire cartridge, having a casing and bullet, through the bore of a large bore center-fire weapon that normally fires a prescribed caliber center-fire cartridge having a bullet diameter larger than the bullet diameter of the small bore rimfire cartridge, said insert comprising:

a barrel section having an open bore extending between a forward end and a breech end for receiving the casing of a rimfire cartridge with the bullet thereof projecting outwardly of the forward barrel section end;

a breech block section removably mounted to the barrel section;

a secondary firing pin mechanism within the breech block section for firing a rimfire cartridge in response to being struck by the firing pin of a center-fire weapon;

a cap of a resilient material shaped in the form of a large bore bullet and having a recess formed therein to be press fitted over the bullet of a rimfire cartridge protruding from the forward barrel section end such that there is intimate surface to surface contact between the cap and rimfire bullet, and wherein the cap further includes a peripheral apron about the recess for slidably engaging the bore of a center-fire weapon; and

wherein the cap, barrel section, and breech block section include an exterior surface configuration when mounted together with a rimfire cartridge in the bore of the barrel section corresponding to the external shape of a large bore center-fire cartridge of a prescribed caliber to facilitate loading, firing, and removal of the rimfire cartridge from a large bore center-fire weapon.

4,506,605

SHOTGUN CARTRIDGE AND WAD THEREOF

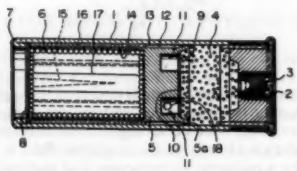
Nagatoshi Maki, 2-48-4, Kamiishihara, Chofu-shi, Tokyo, Japan

Continuation of Ser. No. 214,222, Dec. 8, 1980, abandoned. This application Sep. 2, 1983, Ser. No. 529,007

Claims priority, application Japan, Apr. 15, 1980, 55-048734

Int. Cl.³ F42B 7/02

U.S. Cl. 102—457 19 Claims



1. A wad for use in a cartridge for a shotgun, said cartridge including a case having an outer wall, said wad being located in said case between gunpowder and a charge of pellets, said wad comprising:

a solid cylindrical body having an end face adjacent to the gunpowder and a side surface extending away therefrom;

a plurality of independent, non-axial, symmetrically located blind holes in the end face of said body;

a plurality of independent and separate restriction passages of number equal to the number of blind holes, each of said restriction passages connecting with a different blind hole, said restriction passages being non-radial and extending to the side surface of said body in directions which cause torques due to explosive gas flowing therethrough to be additive;

means attached to the side surface near the bottom of said body, for preventing escape of explosive gas along the side surface;

means for transmitting rotation of said body to said pellets;

means, for attaching said rotation transmitting means to said body; and

means, spaced from said gas escape preventing means and attached to one of said body and said rotation transmitting means, for contacting the wall of said case so as to stabilize said wad as it is propelled from said case;

whereby said blind holes are non-axial so as to be sufficiently spaced from the axis of said body to create in combination with said restriction passages a sufficient torque for rotating said body without creating a large, pressure reducing central chamber.

4,506,606

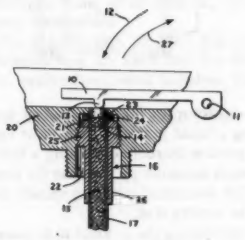
FIRING MECHANISM

Anthony M. Caruso, 1620 Dallas St., Aurora, Colo. 80010

Filed Jan. 27, 1983, Ser. No. 461,400

Int. Cl.³ F42B 27/00

U.S. Cl. 102—487 1 Claim



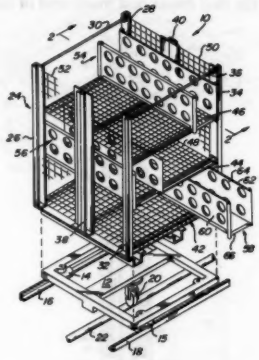
1. A firing mechanism for a grenade comprising, a firing mechanism body having a threaded recess formed therein within said body and a bore through said body formed at one end of said threaded recess, a hollow cylindrical fuze housing, a percussion cap lodged in one end of said fuze housing and mounted in said bore flush with said firing mechanism body, a flange protruding from said housing in a plane generally perpendicular to the longitudinal axis of said cylindrical housing spaced from said percussion cap, a gasket interposed between said flange and said firing mechanism body and adjacent to said bore in order to form a watertight seal therewith, and a threaded ferrule having a heat shield portion extending from said recess along a length of said fuze housing to establish a predetermined fuze burning time, said threaded ferrule being in engagement with said recess threading to bear against said flange and thereby to press said gasket into a water-tight relationship with said bore.

4,506,607

SHELF-TYPE DRIVERLESS VEHICLE

Charles E. Jacoby, Bethlehem, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Apr. 17, 1980, Ser. No. 141,099
Int. Cl.[3] A47B 57/00
U.S. Cl. 108—60 8 Claims



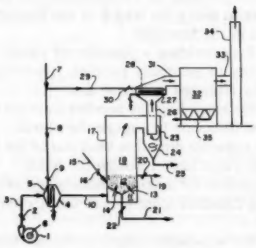
1. Apparatus in of the type disclosed wherein there is provided a plurality of shelves disposed one above the other and on which merchandise may be stacked, at least one divider trough supported by each shelf and moveable with respect to its associated shelf, each trough being open at the top and bottom and being open at each end thereof, a discrete puller member extending between side walls of the trough at each end thereof to facilitate pulling of the trough and any merchandise therebetween toward one side to facilitate access to the last mentioned merchandise, at least one of said puller members being below the top surface of its associated shelf.

4,506,608

UNFIRED DRYING AND SORTING APPARATUS FOR PREPARATION OF SOLID FUEL AND OTHER SOLID MATERIAL

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corp., Gladwyne, Pa.

Continuation-in-part of Ser. No. 464,062, Feb. 3, 1983, Pat. No. 4,449,483. This application Mar. 30, 1984, Ser. No. 595,519
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.[3] F23G 5/00
U.S. Cl. 110—245 6 Claims



1. An unfired drying and sorting apparatus for preparation of solid fuel and other material incorporating:

a fluidized bed consisting of a mixture of moisture bearing solid particles of fuel and other material suspended in a vertical chamber and supported by a floor;

ports in said floor for receiving a continuous supply of pressurized and heated air for fluidizing said bed;

means for continuously supplying unsaturated and pressurized air to said ports at a variable and preselected flow rate;

first steam coil air heater for heating said pressurized air upstream of said ports;

means for selective control of steam supply to said first steam coil air heater;

means for continuously feeding said moisture bearing solid particles to said bed;

means for continuously removing said solid particles from said bed after retention in said bed for some period of time, retention providing time for drying of said solid particles;

means for continuously removing air and vapor generated from said moisture at the outlet of said vertical chamber;

first regulatory means including said means for air supply to said ports at a predetermined flow rate and said means for selective control of steam supply to said first steam coil air heater adapted for maintaining said air and vapor temperature exhausting from said bed in a range of from 100 F. to 150 F. to regulate the degree of moisture removal from said fuel and other material for maintaining the residual moisture in said fuel and other material at a predetermined quantity;

a baghouse filter type or equivalent solids collector connected to said vertical chamber outlet means and including a second steam coil air heater for post-heating said air and vapor discharging from said outlet means before entry to said collector, and

second regulatory means for selective control of steam supply to said second steam coil heater and adapted for maintaining said air and vapor temperature at said second heater outlet at a predetermined value in a range of 20 F. to 112 F. above said air and vapor saturated temperature exhausting from said bed, said post-heating superheating said air and vapor and enabling free passage of said air and vapor through said baghouse without fouling as a result of wetted solid formation on said baghouse collector filters.

4. A process for an unfired drying and sorting apparatus for preparation of solid fuels and other materials which comprises the steps of:

coordinating the integrated process;

introducing a continuous supply of moisture bearing solid particles of fuel and other materials into a fluidized bed in a vertical chamber;

pressurizing a stream of unsaturated fluidizing air and preheating said air stream by passing said air stream through a first steam coil air heater;

introducing said stream of fluidizing air up through the bottom of said bed;

continuously removing said solid particles from said bed after retention in said bed for some period of time, retention providing time for drying of said solid particles;

regulating the degree of moisture removal from said solid fuel and other material for maintaining the residual moisture in said fuel and other material at a predetermined value by selective adjustment of the rate of flow of the fluidizing air stream along with selective adjustment of the rate of steam flow to the steam coil air heater while maintaining temperature of said air and vapor exhausting from said bed in a range of from 110 F. to 150 F.:

withdrawing said air and vapor exiting from said bed and passing said air and vapor mixture through a second steam coil air heater;

adjusting steam supply to said second steam coil heater to maintain temperature of said air and vapor mixture exhausting from said second steam coil heater in a range of from 20 F. to 112 F. above said air and vapor saturated temperature exhausting from said bed; and

passing said air and vapor exiting from said second steam coil heater through a baghouse filter type or equivalent

solids collector for ultimate removal of solids from said air and vapor stream, said second steam coil superheating said air and vapor and enabling free passage of said air and vapor through said baghouse without fouling from wetted solids carried along in said air and vapor stream.

4,506,609

TRASH SEEDER

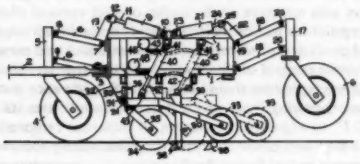
Albert K. Fuss, 1 Jellicoe St.; Eric W. Fuss, 3 Heller St.; Jarvis R. Fuss, 143 Tourist Rd., and Roy M. Fuss, 21 Leslie St., all of Toowoomba, Queensland, Australia 4350

Filed Nov. 29, 1982, Ser. No. 445,101

Claims priority, application Australia, Mar. 22, 1982, P[illegible]3239

Int. Cl.[3] A01C *5/00*

U.S. Cl. 111—52 **5 Claims**



1. An agricultural implement comprising in combination: a main frame, forward caster wheels on height adjusting extensions pivoted on the said main frame to project forwardly from said frame to control the height of the front of the said main frame, hydraulic means to actuate the said extensions, a series of seeding units spaced transversely along the said main frame and supported on respective trailing frames each of which is connected at a forward part to the said main frame by at least a transverse pivot pin, ground opening and seeding devices on each said trailing frame intermediate the ends thereof, a series of press wheels arranged one on the rear part of each said trailing frame, hydraulic means between each said trailing frame and the said main frame rearward of the said pivot pin to support the weight of the rear part of the said main frame from the said press wheels, but to allow each said press wheel to accommodate to inequalities in ground height, said hydraulic means comprising hydraulic rams each connected to at least a common header extending transversely across the said main frame to allow each said press wheel to accomodate to inequalities in the ground height, rear caster wheels on height adjusting extensions also pivoted on the said main frame to project rearwardly from the said main frame to support the rear of the said main frame during transport but arranged to be lifted from ground contact during seeding, to transfer the weight of the main frame to the said press wheels, and hydraulic means to actuate the said last mentioned extensions.

4,506,610

SUBSOIL ROTARY CULTIVATOR

Archie E. Neal, Garfield, Wash., assignor to J. E. Love Co., Garfield, Wash.

Filed Apr. 8, 1983, Ser. No. 483,194

Int. Cl.[3] A01C *7/20*; A01B *33/06*

U.S. Cl. 111—87 **7 Claims**

1. An unpowered subsoil rotating disk cultivator for being pulled behind a tractor or other towing means to cultivate soil, comprising:

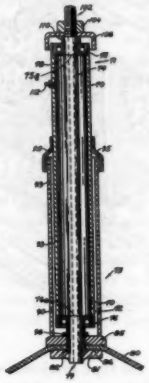
a frame adapted for attachment to the tractor for pulling thereby;

an upstanding main tubular member having an upper end and lower end, and being mounted to the frame adjacent the upper end of said main tubular member;

a central shaft having an upper end and a lower end, the central shaft being rotatably and coaxially supported within the main tubular member by upper and lower bearing means seated in said tubular member, allowing the central shaft to freely rotate relative to the main tubular member;

disc means attached transversely to the central shaft near the lower end thereof and freely rotatable therewith, for piercing and cultivating soil as the disk is pulled through and freely rotates by frictional contact with the soil; and

a shield tube and means for coaxially connecting the shield tube to the disc means and lower end of the central shaft,



to freely rotate therewith; the shield tube extending upwardly from connection with the disc means to encase the lower end and a major length of the main tubular member; the shield tube being diametrically larger than the main tubular member to provide a radial clearance void therebetween; the exterior surfaces of said disc means, shield tube and connecting means rotating simultaneously together to deflect plants and debris and prevent entanglement with the cultivator.

4,506,611

THREE-DIMENSIONAL THICK FABRICS AND METHODS AND APPARATUS FOR MAKING SAME

Leon Parker, Burbank, and Arthur R. Campman, Los Angeles, both of Calif., assignors to Hitco, Newport Beach, Calif.

Division of Ser. No. 86,655, Oct. 22, 1979, Pat. No. 4,331,091. This application Nov. 6, 1981, Ser. No. 319,097

Int. Cl.[3] D05B *1/10*; D05C *15/00*

U.S. Cl. 112—79 R **21 Claims**

1. Apparatus for making a three-dimensional thick fabric comprising the combination of:

means for mounting a laminate of fabric plies;

a plurality of generally parallel, spaced-apart pointed rods commonly mounted in a row;

means for pushing the rods through the laminate at different locations along the length of the laminate to form rows of holes in the laminate;

means for providing a plurality of yarns;

a plurality of generally parallel, spaced-apart needles commonly mounted in a row; and

means for extending the needles through each row of holes in one direction to engage the plurality of yarns and then in an opposite direction back out of the holes to pull loops of the yarns back through the holes.

12. Apparatus for making a hollow, generally circular object of varying diameter from woven fabric comprising the combination of:

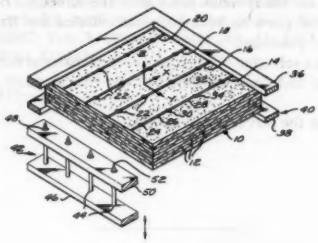
means for weaving a length of woven fabric;

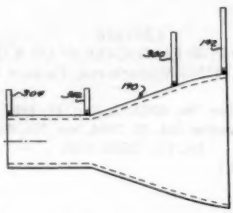
a form defining the inside of the hollow, generally circular object, the form having a varying diameter along the length thereof;

a roller disposed to take up the fabric as the fabric is woven by the means for weaving, the roller having a diameter

which varies along the length thereof in proportion to the diameter of the form along the length thereof;

means for winding a portion of the length of woven fabric on the form to form a multi-ply laminate; and





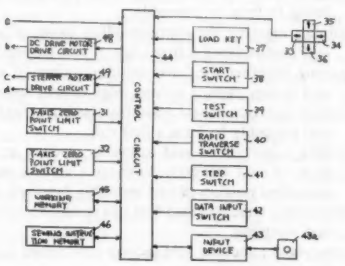
means for repeatedly inserting at least one yarn through the thickness of the multi-ply laminate on the form.

4,506,612

TESTING DEVICE FOR AN AUTOMATIC SEWING MACHINE

Toshiaki Yanagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 13, 1982, Ser. No. 407,800
Claims priority, application Japan, Sep. 1, 1981, 56-137383
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **6 Claims**



1. A testing device for an automatic sewing machine wherein a succession of stitches are formed through variation in relative position between a needle and a work holder according to a batch of positional data representing positions of said stitches and stored in memory means, said testing device comprising:

drive means for varying said relative position; and

control means for controlling the operation of said driving means without reciprocating movements of said needle during operation of said testing device in one of a first test mode and a second test mode, said control means including

first control means, operable in said first test mode, for executing said positional data for only one of said stitches at one time, to intermittently move said work holder from one stitch position to the next,

second control means, operable in said second test mode, for processing said positional data for a predetermined plural number of successive ones of said stitches, to continuously move said work holder at one time from one stitch position to another which is ahead of said one stitch position by said plural number of stitches, and

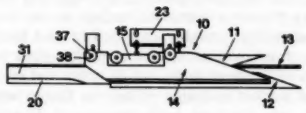
switching means for selectively actuating said first or second control means to test said batch of positional data in the corresponding first or second test mode.

4,506,613

HEMMER

Chris Ragnebring, Borås, Sweden, assignor to Akab of Sweden AB, Borås, Sweden

Filed May 17, 1983, Ser. No. 495,530
Claims priority, application Sweden, May 27, 1982, 8203288
Int. Cl.³ D05B *35/02*
U.S. Cl. 112—143 **7 Claims**



1. A hem forming device for forming double-folded hems along a lateral edge of a material as the material is fed forwardly through the device comprising:

an elongated substantially flat main bar having substantially straight and parallel inner and outer edges and a planar section and a first bevelled material entry edge at one end portion extending between said inner and outer edges, and a longitudinal curved section extending along said inner edge at the other rear portion curving back upon said main bar forming a concave folding surface facing toward said outer edge and having a bevelled entrance edge portion extending from said inner edge;

a substantially flat elongated folding rule having a folding inner edge and an outer edge and extending substantially parallel to said main bar in spaced relationship thereto, said inner edge of said folding rule extending substantially parallel to said inner and outer edges of said main bar, and a second bevelled material entry edge at one end facing oppositely to said first bevelled entry edge, said folding rule overlapping said main bar with the inner folding edge of said folding rule passing over said first bevelled edge between the ends thereof; and

a rear section on said folding rule having an inner edge continuous with said inner edge of said folding rule and a folding outer edge extending in adjacent spaced relation to said concave folding surface with the plane of said rear section passing through said concave surface;

so that the lateral edge of the material fed through said first and second bevelled edges of the device will be folded by said first bevelled edge downwardly and around and upwardly into the space between said main bar and folding rule at the overlapping part, and thereafter folded upwardly around said outer folding edge of said rear section of said folding rule and onto the top surface of said folding rule by said concave folding surface at the rear portion of said main bar.

4,506,614

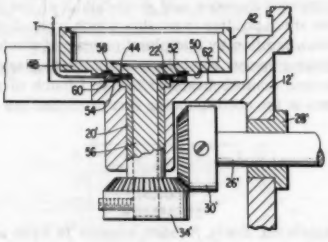
ANTI-JAM THRUST WASHER FOR SEWING MACHINE LOOPTAKER

Robert H. Larsen, Middletown, and Charles R. Odermann, Montville, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 11, 1983, Ser. No. 512,833

Int. Cl.³ D05B *57/08, 57/36*

U.S. Cl. 112—228 **3 Claims**



1. In a sewing machine; a looptaker including a hook body with a depending shaft and an annular recess in the underside of the hook body; a bushing which is affixed in the bed of the machine with the axis extending vertically and the upper end projecting beyond a horizontal surface in the bed, the looptaker shaft being rotatably mounted in said bushing; and a rotatable thrust washer on the looptaker shaft between the underside of the hook body and an upper end of the bushing, the thrust washer including an annular flange which extends upwardly into the hook body recess, and an annular flange which extends downwardly beyond the upper end of the bushing, said upwardly and downwardly extending annular flanges extending to the periphery of the thrust washer and presenting a movable exposed peripheral portion of greater width than the distance between said upper end of the bushing and the underside of the hook body to thread extending under the looptaker to the thrust washer.

4,506,615

METHOD FOR ATTACHING READY-MADE PIECES OF MATERIAL TO ANOTHER PIECE OF MATERIAL

Hans Bächtiger, Stallikon, Switzerland, assignor to Gygli Technik AG, Kollermuhle, Switzerland

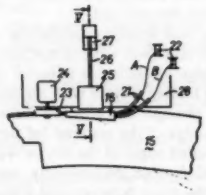
PCT No. PCT/CH82/00008, § 371 Date Sep. 16, 1982, § 102(e) Date Sep. 16, 1982, PCT Pub. No. WO82/02478, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 19, 1982, Ser. No. 420,245

Claims priority, application Switzerland, Jan. 22, 1981, 415/81

Int. Cl.³ D05B *1/00*

U.S. Cl. 112—262.1 **19 Claims**



8. A method of attaching ready-made pieces of material, particularly collars, cuffs, button and buttonhole tapes and other trimmings to a further piece of material, comprising the steps of:

forming a ready-made piece of material from at least two material portions;

bending selvedges of the two material portions of the ready-made piece in opposite directions, folding the selvedges and then fixing the selvedges in folded positions;

turning the ready-made piece after the selvedges of the two material portions have been bent, folded and fixed in the folded positions;

locating a selvedge of a further piece of material between the folded and fixed selvedges of the two material portions; and

fastening the selvedges by stitching.

4,506,616

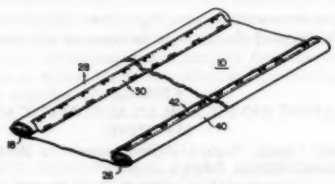
METHOD FOR FABRICATION OF A QUILT

Noma M. Nixon, 13340 Winterhaven, Farmers Branch, Tex. 75234

Continuation of Ser. No. 409,033, Aug. 18, 1982, abandoned. This application Jul. 20, 1984, Ser. No. 632,683

Int. Cl.³ D05B *1/00*

U.S. Cl. 112—262.1 **9 Claims**



1. A method for fabricating a quilt having a top lining, a bottom lining and a batt, the method comprising the steps of:

placing said batt between said top lining and said bottom lining to form an assembly,

joining together the corresponding edges of said batt and said linings along a first edge of said assembly;

joining together the corresponding edges of said batt and said linings along a second edge of said assembly;

rolling a portion of said assembly starting at said first edge of said assembly to form a first roll,

rolling a portion of said assembly starting at said second edge of said assembly to form a second roll leaving a nonrolled portion of said assembly between said rolls,

removably attaching said first roll to said unrolled portion of said assembly,

removably attaching said second roll to said nonrolled portion of said assembly,

sewing along said unrolled portion of said assembly to join together said linings and said batt,

detaching said first roll from said unrolled portion of said assembly,

sewing along the portion of said assembly previously in said first roll to join together said linings and said batt,

detaching said second roll from said unrolled portion of said assembly, and

sewing along the portion of said assembly previously in said second roll to join together said linings and said batt, thereby producing said quilt.

4,506,617

SHIP

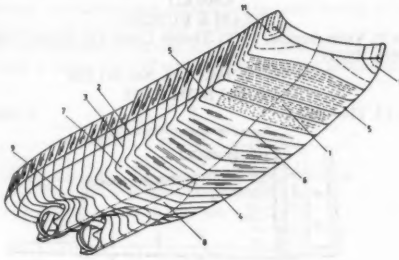
Heinrich Waas, Bonn; Ayres Freitas, Emden; Jürgen Schultz, Leer, and Günter Varges, Emden, all of Fed. Rep. of Germany, assignors to Thyssen Nordseewerke GmbH, Emden, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,056

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143857; Feb. 3, 1982, 3203468; Jun. 11, 1982, 3221924; Sep. 11, 1982, 3233816

Int. Cl.³ B63B *35/08*

U.S. Cl. 114—41 22 Claims



1. A ship comprising a hull having a center keel and being elongated in the direction of the center keel and having a water line extending around the hull, a plurality of frames extending transversely of the center keel and said frames spaced apart in the elongated direction of said hull, said hull comprising a pontoon-shaped prow located above the waterline, said hull having side walls extending in the elongated direction thereof, said side walls in said pontoon-shaped prow extending parallel relative to one another, said pontoon-shaped prow having a downwardly facing front surface extending over the entire beam of said hull, said front surface has a flat portion and extends downwardly and rearwardly and meets said center keel below the waterline, wherein the improvement comprises a region of transition between said prow side walls and said front surface with said region of transition forming lateral edges extending in the elongated direction of said hull and projecting laterally outwardly from said prow side walls so that the distance between said lateral edges is greater than the distance between the upper edges of said prow side walls, said lateral edges projecting laterally outwardly for the maximum amount at a location spaced rearwardly from the flat portion of said front surface and said lateral edges having reduced outward projections from the maximum projection in the rearward direction of the hull, said hull having a bottom and said front surface meeting said bottom at a location spaced rearwardly from the flat portion of said front surface, said lateral edges of said prow side walls comprise cutting edges, said cutting edges are inclined downwardly from the front of said hull and are curved in the elongated direction of the hull, said front surface having an approximately horizontal portion below the waterline and said front surface rearwardly of said horizontal portion forming a skid extending along said center keel with said front surface sloping upwardly on both sides of said skid to the lateral edges thereof, so that said skid in said front surface defines an ice-breaking profile.

4,506,618

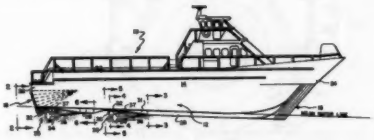
PROPELLER AND KEEL ARRANGEMENT FOR SURFACE EFFECT SHIPS

John B. Chaplin, Covington, La., assignor to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 440,943, Nov. 12, 1982, abandoned. This application Jun. 25, 1984, Ser. No. 624,370

Int. Cl.³ B63B *1/38*

U.S. Cl. 114—67 A 4 Claims



4. In an air cushion supported vehicle of the surface effect ship type having a main hull and longitudinally extending rigid side walls depending downwardly from opposite sides of said main hull wherein each of said side walls is defined by outer and inner surfaces and a generally continuous longitudinally extending bottom planing surface transversely connecting the lower extremities of said inner and outer surfaces, thereby comprising the side wall keels of said ship; the improvement comprising:

each of said planing surfaces being generally canted in upwardly outboard direction relative to the longitudinal configuration of said ship and having a localized, vertically and horizontally profile-recessing planar discontinuity therein, whereby each said discontinuity creates a localized channel permitting escape of cushion air transversely of its associated one of said side walls;

a propeller drive shaft extending from and blow and in acute-angled relation with each of said planing surfaces; and

propellers keyed to said shafts, said propellers partially extending below said planing surfaces and positioned one within each of said discontinuities so as to operate efficiently in hydrodynamic association therewith while generating throughout said discontinuities under high speed operating condition accelerated water-flow bore effects operating to counter escape of cushion air from beneath said hull by way of said discontinuities.

4,506,619

WING SAIL DRIVE SYSTEM

Alexander P. Bates, Hingham, and Philip E. Harcourt, Norwell, both of Mass., assignors to Lloyd Bergeson, Norwell, Mass.

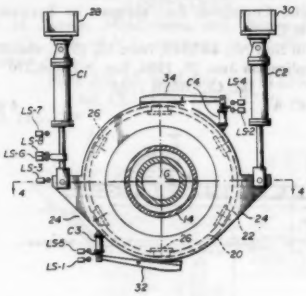
Filed Sep. 8, 1982, Ser. No. 416,080

Int. Cl.³ B63H *9/06*

U.S. Cl. 114—91 6 Claims

1. A mast rotating means for a mast rotatbly mounted on a support, comprising a rotatable mast driving structure disposed around the mast, first releasable means for rendering the mast non-rotatable in relation to the support, second releasable means for rendering the mast driving structure non-rotatable in relation to the mast, means for causing rotation of said mast driving structure in a desired direction when the mast driving structure is rendered non-rotatable in relation to the mast, and third means for causing rotation of the drive structure in the opposite direction when the second releasable means is released to allow the drive structure to rotate in relation to the mast and when the first releasable means has rendered the mast non-rotatable in relation to the support,

in which release of the first releasable means causes engagement of the second releasable means, and the engagement



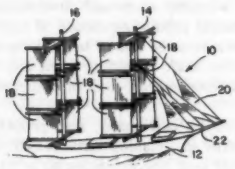
of the second releasable means causes said third means to rotate the mast through a predetermined arc.

4,506,620

SAILBOAT HAVING CONVERTIBLE RIG

Stanley Gerr, East Haddam, Conn., assignor to Mark T. Huxley, New York, N.Y., a part interest

Filed Jun. 23, 1982, Ser. No. 391,228
Int. Cl.³ B63H *9/10*
U.S. Cl. 114—102 **10 Claims**



1. A sailboat comprising:

(a) at least one mast;

(b) first and second pairs of primary half yards pivotally mounted on said mast for pivoting substantially about the axis of said mast between a first position wherein the members of each pair of said primary half yards extend in opposite directions from the same axial location along said mast to define a 180° angle therebetween and a second position wherein the members of each pair of said primary half yards extend in substantially the same direction from the same axial location along said mast to define a substantially 0° angle therebetween, said second pair of primary half yards being vertically spaced from said first pair of primary half yards along said mast;

(c) means for moving said primary half yards between the first and second positions, said sailboat being convertible between square-rigged when said primary half yards are in said first position and fore-and-aft rigged when said primary half yards are in said second position; and

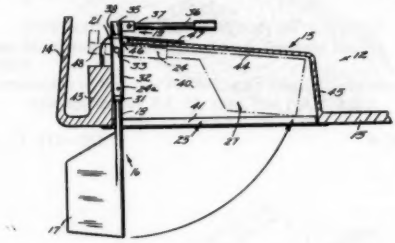
(d) means for mounting a sail between vertically spaced apart members of each pair of primary half yards, said means for mounting a sail comprising a secondary half yard pivotally mounted on each primary half yard for pivotal movement about a pivot axis extending substantially parallel to said mast, said secondary half yards mounted on said first pair of primary half yards oppositely facing and spaced from said secondary half yards mounted on said second pair of primary half yards, each pair of vertically spaced opposed secondary half yards comprising sail mounting means for mounting a sail therebetween, said sail being pivotable with said pair of sail mounting secondary half yards between a basic position wherein said secondary half yards extend substantially coextensively with said primary half yards on which they are mounted and an angle position wherein each said pair of sail mounting secondary half yards is arranged at an angle greater than 0° and less than 180° to said primary half yards on which they are mounted, said sailboat being convertible between square rigged when said secondary half yards are in said basic position and said primary half yards are in said first position and fore-and-aft rigged when either said secondary half yards are in said basic position and said primary half yards are in said second position or said secondary half yards are in said angle position with said sails oriented substantially fore-and-aft and said primary half yards are in said first position.

4,506,621

TILTABLE RUDDER

John P. Vanlerberghe, 11101 Timber Creek Dr., Grand Ledge, Mich. 48837

Filed May 4, 1983, Ser. No. 491,526
Int. Cl.³ B63H *25/38*
U.S. Cl. 114—162 **6 Claims**



1. A rudder storage structure for sailboats comprising:

a rudder trunk defining an opening through the bottom of a sailboat and rising in the same plane as the keel of said sailboat along and into the cockpit of said sailboat and adjacent the transom of said sailboat and further defining a rudder concealing cavity including journal means and an upper aft operating slot, said trunk including an aft-most wall and a forward cavity portion;

a tubular sleeve having transverse trunnions extending operably into said journal means in said trunk;

a rudder pivotally supported in said trunk having a rudder post extending axially through said sleeve and supported by said journal means and movable to a first operating position, said sleeve engaging the aft-most wall of said trunk and pivotally movable to a second inoperative position in the forward cavity portion of said trunk; and

stop means selectively securing said rudder in selected of said two extremes of position.

4,506,622

HAWSER LINE FLOTATION

Joseph J. Linehan, Arlington, and Phillip S. Amato, Saugus, both of Mass., assignors to Samson Ocean Systems, Inc., Waltham, Mass.

Filed Nov. 22, 1983, Ser. No. 554,290
Int. Cl.³ B63B *21/52*
U.S. Cl. 114—230 **5 Claims**

1. In a float element for a hawser line, such as used on a single point mooring, said float element being adapted for attachment about a hawser line,

said element having a fixed, finite length and further being adapted for attachment to said hawser line in a manner to permit elongation of said hawser line under load with said flotation element in place,

the improvement wherein,

said float element has a male end portion and an opposed female end portion,

said element being adapted to be attached about said hawser line with the male end portion of a first said element adjacent the female end portion of a second said element,

the male end portion of said first element installed about said line having an outside diameter significantly less than the inside diameter of the female end portion of said second element,

said float element comprising

a flexible casing adapted for attchment about said hawser line,

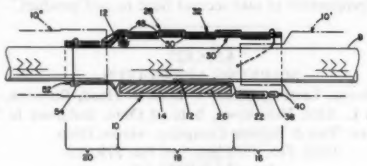
adjacent to opposed edges, said casing defining attachment means for fixable interconnection of said edges for attachment of said casing about said hawser line, and

secured within said casing, a plurality of float components having specific gravity less than that of water,

said float components comprising

a broad, circumferential section within said casing at the female end portion of said float element,

said circumferential section adapted, within said casing, to form a relatively stiff collar encircling said hawser line,



the circumference of said collar significantly exceeding the circumference of the encircled hawser line, thereby forming an annular aperture between the casing and the line for insertion of the male end portion of an adjacent float element, and

a multiplicity of relatively rigid elongated sections arrayed coaxially within said casing, generally parallel to said opposed edges, said elongated sections being adapted for attachment, within said casing, about said hawser line, coaxially therewith,

the first ends of said elongated sections lying adjacent the inwardly directed edge of said circumferential section,

the opposed ends of said elongated sections lying spaced from the opposite end of said casing,

the end of said casing extending axially beyond said elongated sections being adapted for attachment closely about said hawser line,

whereby, under substantial load applied to said hawser line, the female end portion of said second element is adapted to enclose the male end portion of said first element and said hawser line is continuously enclosed by said adjacent elements substantially over their combined length.

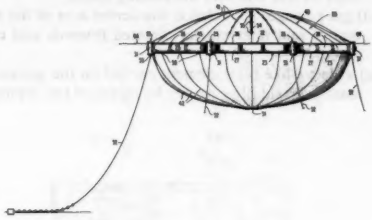
4,506,623

NON-RIGID BUOYANT MARINE STORAGE VESSELS FOR FLUIDS

Brett E. Roper, The Woodlands, and Juan M. Herrera, El Paso, both of Tex., assignors to Oilfield Industrial Lines, Inc., Big Spring, Tex.

Filed Feb. 25, 1983, Ser. No. 469,981
Int. Cl.³ B65D *89/10*
U.S. Cl. 114—256 **15 Claims**

1. A marine storage vessel for fluids comprising a flexible containment body portion formed of tough and durable sheet material and having an inlet and outlet means for fluid near its top, and a segmented marginal flotation and confining frame for the containment body portion surrounding the latter, the segments of said frame being substantially rigid and including flotation components, and means joining the segments end-to-end in articulated relationship for articulation one relative to another on substantially vertical and horizontal axes, the articulation of the frame segments on the horizontal axis being substantially free, the articulation of the frame segments on the



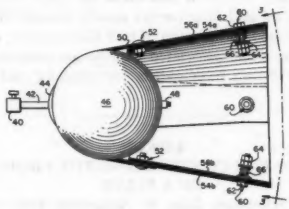
vertical axis being controlled, to thereby prevent the frame from collapsing inwardly on the flexible containment body portion under the pressure of sea water in a storm.

4,506,624

TROWEL FOR SMOOTHING MORTAR ON THE INTERIOR OF A PIPE

Frank Donnelly, Rockaway, N.J., assignor to Spiniello Construction Company, Morristown, N.J.

Filed Sep. 11, 1981, Ser. No. 301,431
Int. Cl.³ B05C *7/06, 11/04*
U.S. Cl. 118—105 **10 Claims**



1. A trowel for smoothing mortar coated on the interior wall of a pipe, said trowel comprising an elastic member substantially spherical in shape for receiving pressurized air and inflating to a diameter less than the interior diameter of said pipe, and blade means having one end connected to and extending from said elastic member, and the other end of said blade means defining an outer circular surface substantially corresponding to the coated interior diameter of said pipe for engaging and smoothing said mortar.

4,506,625

POWDER SPRAY CHAMBER

Gerhard F. Vöhringer, Friedrichshafen, Fed. Rep. of Germany, assignor to ESB Elektrostatische Sprüh und Beschichtungsanlagen G.F. Vöhringer GmbH, Meersburg, Fed. Rep. of Germany

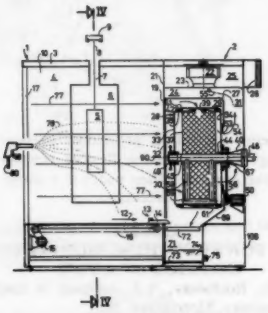
Filed Aug. 3, 1983, Ser. No. 520,065
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229717
Int. Cl.³ B05B *15/00*
U.S. Cl. 118—312 **15 Claims**

1. A powder spray chamber having at least one inlet spray opening for coating the surface of workpieces disposed in a coating space of said spray chamber, including:

(a) a rotationally symmetrical filter carrier having a gas-permeable mantle portion and gas non-permeable end portions;

(b) a rearwardly disposed separating wall in said chamber separating said coating space from a clean air space;

(c) an opening in said separating wall within which said filter carrier is rotatingly supported to sealingly project therefrom its free end into the coating space;
(d) gas passages provided in the center area of the end portion of said filter carrier directed towards said clean air space;
(e) a sleeve-like filter element carried on the gas-permeable mantle of said filter carrier by means of two frontal rings,



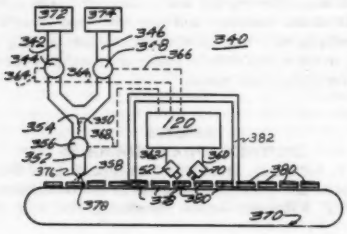
said filter element being removable into said coating space;
(f) a vacuum source in said clean air space establishing a vacuum on said filter carrier mantle through the gas passages of said end portion of said filter carrier; and
(g) cleaning means associated with the gas-permeable mantle portion of said filter carrier for cleaning said filter element.

4,506,626

APPARATUS FOR CONTROLLING THE PROPORTIONS OF A FLUID

Richard H. Schurman; John W. Schurman, both of Bothell, 98011; Richard W. Clark, Seattle, 98109, and Steven Reiter, 20406 Poplar Way, Lynnwood, all of Wash. 98036

Division of Ser. No. 317,539, Nov. 2, 1981,. This application Sep. 24, 1982, Ser. No. 423,119
Int. Cl.[3] B05B *12/08, 12/14*
U.S. Cl. 118—665 **25 Claims**



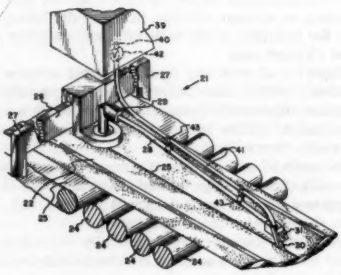
1. An apparatus for controlling the proportions of a first fluid and a second fluid, said apparatus comprising:
a. a combining means for combining said first fluid and said second fluid to form a product;
b. a substrate;
c. a means to apply said product to said substrate to form a color on said substrate;
d. a source of first light waves of an initial intensity;
e. a directing means to direct said first light waves to said color on said substrate;
f. after said first light waves have left said color determining the final intensity of said first light waves by a determining means;
g. a means to compare said initial intensity and said final intensity of said first light waves to determine a characteristic of said color and thereby a characteristic of said product;
h. a source of second light waves of an initial intensity;
i. a directing means to direct said second light waves to said color on said substrate;
j. after said light waves have left said color and said substrate a determining means to determine the final intensity of said second light waves;
k. a means to compare said initial intensity and said final intensity of said second light waves to determine a characteristic of said color and thereby a characteristic of said product; and,
l. a control means operatively connecting with said means to compare said initial intensity and said final intensity of said first light waves to control the proportion of said first fluid in said product and a control means operatively connecting with said means to compare said initial intensity and said final intensity of said second light waves to control the proportion of said second fluid in said product.

4,506,627

MARKING APPARATUS

Joe P. Boone, Lawton, Okla.; William J. Head, Ravenna, and Steven L. Kitz, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 13, 1984, Ser. No. 579,918
Int. Cl.[3] B05C *5/02*
U.S. Cl. 118—708 **7 Claims**



1. A marking apparatus comprising:
(a) a bar member supported by a means for support;
(b) a tracking arm member having first and second ends, the first end of said tracking arm member being pivotally attached to said bar member, said tracking arm member extending generally in a direction transverse to said bar member;
(c) a stylus member attached to said tracking arm member near the second end of the tracking arm member, said stylus member having a foot with a notch therein, said notch being oriented parallel with the longitudinal axis of said tracking arm member, said stylus member having a bore therethrough with first and second ends, the first end of said bore communicating with the notch in said foot, said bore having a cross-sectional width at its first end that is less than the cross-sectional width of said notch;
(d) a reservoir for marking fluid, said reservoir having an outlet; and
(e) a hollow tube having a pair of ends, one end of said hollow tube communicating with the outlet of said reservoir and the other end of aid hollow tube communicating with the second end of the bore through said stylus member.

4,506,628
ANIMAL LITTER

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807

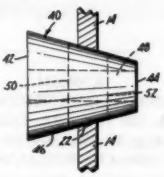
Filed Jul. 13, 1983, Ser. No. 513,178
Int. Cl.[3] A01K *1/015*
U.S. Cl. 119—1 22 Claims

1. An animal litter composition being selected from a group consisting of coal residue, alumina, aluminosilicate and mixtures thereof, said composition mixed and polymerized in-situ with a monomer or monomers containing at least one acidic functional group present in the molecule.

4,506,629
METHOD OF REPAIRING DAMAGED ENTRANCE TO A BIRDHOUSE

Bert S. Cross, Box 3806, Tequesta, Fla. 33458

Filed Aug. 22, 1983, Ser. No. 524,986
Int. Cl.[3] A01K *31/00*
U.S. Cl. 119—23 3 Claims



1. A method of repairing a damaged entrance to the nesting cavity of a birdhouse, having a chewed out opening of a range of sizes, the method comprising:

providing a body having first and second spaced-apart oppositely facing surfaces, the first surface being appreciably larger than the second surface, and a tapered side wall surface extending from the first surface to the second surface to provide a body of frusto-conical shape, said body having an aperture extending therethrough between the oppositely facing surfaces and of a size to admit the desired species of bird but small enough to exclude squirrels and larger birds, and

inserting said body into the damaged entrance of a birdhouse so that the conical side wall surface frictionally engages the edges of the damaged entrance of the birdhouse, the body being retained within the entrance to the birdhouse, the aperture in the body defining a new smaller entrance to the nesting cavity of the birdhouse of a size to admit the desired species of bird.

4,506,630
APPARATUS FOR SUSTAINED DISPENSATION OF A CHEMICAL AGENT EXTERIORALLY OF AN ANIMAL

Jakie A. Hair, Rte. 5, Box 188A, Stillwater, Okla. 74074

Filed Sep. 30, 1982, Ser. No. 428,641
Int. Cl.[3] A01K *29/00*
U.S. Cl. 119—156 9 Claims

1. Apparatus for sustained dispensation of a chemical agent exteriorally of the ear of an animal comprising:

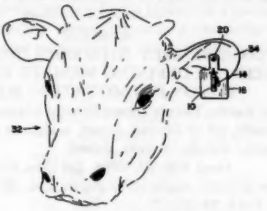
a tag;

means of attaching the tag to the ear of an animal;

a small closed vial having a chemical agent therein;

a wick of small cross-sectional dimensions extending sealably from the interior to the exterior of said vial; and

means of attaching said vial to said tag, said vial and tag being of dimensions such that said vial and wick remain

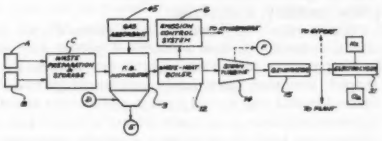


substantially within the confines of and adjacent to the animal's ear to which the tag is affixed.

4,506,631
PROCESS TO PRODUCE HYDROGEN AND OXYGEN UTILIZING THE ENERGY CONTENT OF WASTE MATERIALS

Dheera Phong-Anant, New Lambton Heights, Australia, assignor to Lawrence Waldemar Ihnativ and Alan Bruce Squire, both of New South Wales, Australia

Filed Jun. 22, 1983, Ser. No. 506,879
Claims priority, application Australia, Jun. 22, 1982, PF4533
Int. Cl.[3] C25B *1/04*
U.S. Cl. 122—2 9 Claims



1. A self sustaining continuous process for production of high purity hydrogen and oxygen by the disposal of solid and liquid, combustible and non-combustible wastes, which process comprises the steps of:

(i) reducing said solid waste to a suitable and uniform size and recovering metal waste therefrom,

(ii) drying said reduced solid waste,

(iii) feeding said solid and liquid wastes to a fluidised-bed incinerator operated at at least atmospheric pressure together with combustion air and hydrogen produced by electrolysis wherein the ratio of combustible to non-combustible feeding materials and air supply is controlled and regulated such that the requirement for supplementary fuel is either eliminated or minimized and the optimum incineration conditions are continuously maintained,

(iv) recovering water produced from incineration of said liquid wastes,

(v) recovering thermal energy from said incinerator in a heat recovery means to produce steam which is used to drive a steam turbine,

(vi) employing said heat recovery means or said steam turbine to drive a generator alternator to produce electricity,

(vii) producing hydrogen and oxygen from at least a portion of the water of step (iv) by electrolysis using at least a portion of the electricity of step (iv),

(viii) removing pollutant species from solid, liquid and gaseous emissions of said incinerator,

(ix) recycling a portion of the hydrogen of step (vii) to the fluidised-bed incinerator of step (iii) as fuel and recycling a portion of the oxygen of step (vii) when additional excess oxygen is required for the incineration,

(x) recycling a portion of the electricity of step (vi) to operate other steps of the process as required,

(xi) recycling a portion of the water of step (iv) to operate other steps of the process where water is consumed, and

(xii) employing the thermal energy from said incinerator as heat in other steps of the process where heat is consumed.

4,506,632

PISTON ASSEMBLY WITH COOLING LUBRICANT RESERVOIR DEFINING MEMBER ENGAGED TO PISTON PIN MOUNTING BOSSES

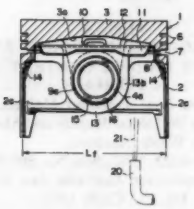
Mutsumi Kanda; Tokuta Inoue; Souichi Matsushita, and Kiyoshi Nakanishi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 25, 1984, Ser. No. 623,932

Claims priority, application Japan, Jul. 28, 1983, 58-138183; Jan. 24, 1984, 59-010677

Int. Cl.³ F01P *3/10*; F02F *3/20*

U.S. Cl. 123—41.35 **14 Claims**



1. For an internal combustion engine:

a piston assembly, comprising:

(a) a piston main body, comprising a piston crown portion and a generally hollow cylindrical piston wall portion joining thereto which together define a generally cup-shaped structure, and further comprising two bosses formed in said piston wall portion and located at mutually opposite positions on opposite sides of a central axis of said piston main body so as to have mutually opposing inner end portions, each of said two bosses being formed with a central positon pin hole, axes of said two piston pin holes of said bosses being coincident and intersecting said central axis of said piston main body substantially at right angles; and

(b) a lubricant reservoir defining member comprising:

(b1) a shelf plate main body portion formed with a depression which defines a lubricant reservoir; and

(b2) two major legs, each connecting at one end thereof to a part of said shelf plate main body portion and formed adjacent another end thereof with a hole and with an annular portion surrounding said hole, each of said annular portions being engaged with the inner portion of a corresponding one of said bosses and surrounding the piston pin hole thereof, so as to mount said lubricant reservoir defining member in said cup shaped structure of said piston main body with said shelf plate generally parallel and opposing said piston crown portion.

4,506,633

INTERNAL COMBUSTION ENGINE

Heinz Britsch, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

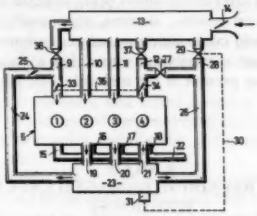
Filed Jun. 29, 1982, Ser. No. 393,352

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125647

Int. Cl.³ F02M *25/06*; F02B *75/00*

U.S. Cl. 123—59 EC **16 Claims**

1. An internal combustion engine, comprising a plurality of cylinders each having inlet and outlet sides and used differently for starting and operation; fuel supply means; an accumulating container; a plurality of aspirating passages each for a respective one of said cylinders; first blocking means; second blocking means, at least one of said cylinders being separable from said fuel supply means by said first blocking means and connected at its outlet side with said accumulating container for a medium aspirated therethrough, and at least another of said cylinders being connected at its inlet side with said accumulating container and separable from said fuel supply means



by said second blocking means; and separate throttles provided in the aspirating passages of both said one and said other cylinders, each of said first and second blocking means including a check valve arranged in the aspirating passage of a respective one of said one and other cylinders provided with said separate throttles.

4,506,634

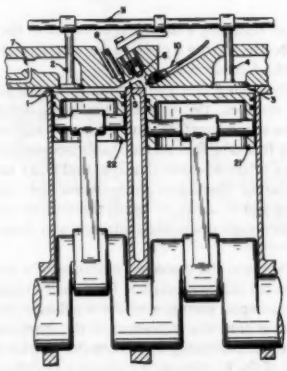
INTERNAL COMBUSTION ENGINE

Jack L. Kerrebrock, 108 Tower Rd., Lincoln, Mass. 01773

Filed Aug. 26, 1982, Ser. No. 411,623

Int. Cl.³ F02B *33/00*

U.S. Cl. 123—68 **19 Claims**



1. An internal combustion engine comprising at least one pair of a compressor and an expander positive displacement devices connected by a transfer passage, the passage controlled by a transfer valve, which allows passage of a gas after compression thereof from the compressor to the expander and is closed during expansion and recompression in the expander to prevent a flow of combusted gas into the compressor, said engine having a means for adding a fuel to the gas prior to the transfer valve, and the displacement devices operating cooperatively, the compressor serving to ingest and compress the gas without combustion, the expander having a displacement at least equal to the compressor, and leading the compressor in their cooperative cyclical motion by about 10 to no greater than 35 degrees to give a desired compression ratio, serving to permit gas combustion without further compression and expansion of the combusted gas, and to recompress a remainder to a pressure nearly equal to the pressure generated by the

compressor said recompressed remainder providing ignition by mixing with the gas compressed by the compressor during transfer into the expander.

4,506,635

VALVE CONTROL FOR A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

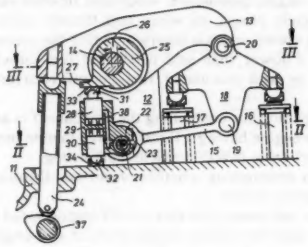
Cornelis van Rinsum, Kressbronn, Fed. Rep. of Germany, assignor to MTU-Motoren- Und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,783

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319637

Int. Cl.³ F01L *1/26*

U.S. Cl. 123—90.22 **20 Claims**



1. A valve control for a reciprocating piston internal combustion engine with a cylinder head, comprising a rocker arm means, bearing support means, pivotal connecting means including a shaft retained by the bearing support means for rotatably supporting the rocker arm means at the cylinder head, two valves, a cross member for actuating said two valves in unison, guide arm means, said rocker arm means and guide arm means being pivotally connected with said cross member, said guide arm means being arranged substantially parallel to the rocker arm means between a pivotal connecting means at the bearing support means and the pivotal connection at the cross member, the points of rotation of the pivotal connecting means of the rocker arm means and of the guide arm means at the bearing support means being each individually adjustable by an eccentric means, an automatic adjusting means cooperating with the eccentric means, and the eccentricities of the two eccentric means being disposed substantially perpendicularly in the starting position.

4,506,636

DEVICE FOR CONTROLLING A GAS CIRCUIT OF A COMBUSTION CHAMBER AND A SEALING MEMBER FOR ITS OPERATION

Guy Negre, Vinon, and Jean-Claude Fayard, Lyons, both of France, assignors to Elf France, Courbevoie, France

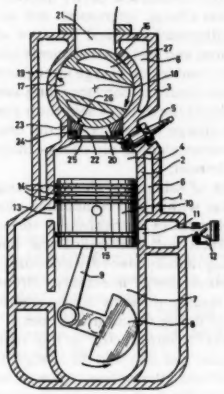
Filed Jul. 25, 1983, Ser. No. 517,030

Claims priority, application France, Jul. 27, 1982, 82 13071; Jul. 27, 1982, 82 13072

Int. Cl.³ F01L *7/16*

U.S. Cl. 123—190 A **17 Claims**

1. A control device for the evacuation of exhaust gases from a combustion chamber of an internal combustion engine, comprising rotary valve means including a transverse flow channel, the rotary valve means performing one of a continuous and oscillating turning movement synchronized with a rotation of a crankshaft of the engine, so that the channel is periodically positioned in communication on one side thereof with a first orifice directly connected to the combustion chamber and, on another side thereof, with a second orifice connected to an exhaust port for emitting burned gases from the combustion chamber, and during remaining times to seal the orifices, in synchronization with the respective phases of compression, the rotary valve means being contained in a first bore into which issues the first orifice directly connected to the combustion chamber and the second orifice connected to the exhaust port, the first orifice connected to the combustion chamber being arranged within annular sealing means housed in a second bore and said annular sealing means contacting the rotary valve means by the pressure prevailing in the combustion chamber



and including at least one resilient annular sealing element, said at least one annular sealing element being able to slide in the second bore and its travel distance being limited, on one side thereof, by the rotary valve means and, on another side thereof, by a retaining shoulder, and the rotary valve means including at least one cavity surrounding its transverse flow channel for the circulation of a cooling fluid.

4,506,637

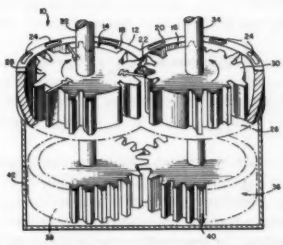
ROTARY INTERNAL COMBUSTION ENGINE

William R. Reinhold, Southport, N.C., assignor to Rotorque Associates, Southport and Boiling Spring, N.C.

Filed Dec. 1, 1983, Ser. No. 556,895

Int. Cl.³ F02B *53/00*

U.S. Cl. 123—246 **6 Claims**



1. A rotary internal-combustion engine comprising:

a housing defining a pair of parallel cylindrical cavities having interior walls and intersecting each other to define an intersection region;

a pair of rotor elements fixed to parallel shafts extending coaxially in said cylindrical cavities and confronting each other in said intersection region;

a synchronizing arrangement coupled to said shafts externally of said cylindrical cavities for ensuring that said rotor elements rotate smoothly with respect to each other and at the same angular velocity but in opposite directions such that confronting portions of said rotor elements

move in generally the same direction within said intersection region;

each of said rotor elements having a generally cylindrical outer surface spaced from the interior wall of the corresponding cylindrical cavity and having a plurality of sealing vane structures projecting radially outwardly from said cylindrical outer surfaces to sealingly confront the respective cylindrical cavity interior wall;

combustion charge interspaces and air charge interspaces being alternately defined between adjacent sealing vane structures, and said rotor elements being sychronized such that the combustion charge interspaces of one of said rotor elements confront corresponding combustion charge interspaces of the other of said rotor elements, and such that the air charge interspaces of the one rotor element confront corresponding air charge interspaces of the other rotor element;

said shafts of said rotor elements being spaced a distance such that within said combustion charge interspaces said rotor element cylindrical outer surfaces closely confront each other, and said cylindrical outer surfaces further including radially inwardly extending recesses within said combustion charge interspaces circumferentially located within leading portions of said combustion charge interspaces to define combustion zones;

intake ports for introducing air into said combustion charge interspaces and into said air charge interspaces at a point ahead of said intersection region as said rotors rotate;

exhaust ports for discharging combustion products from said combustion charge interspaces and air from said air charge interspaces at a point following said intersection region as said rotors rotate;

an injector for injecting fuel into said combustion charge interspaces only so as to form a fuel/air mixture; and

an ignitor for igniting the fuel/air mixture within the combustion zones.

4,506,638

METHOD AND APPARATUS FOR CONTROLLING FUEL CUT-OFF IN AN INTERNAL COMBUSTION ENGINE

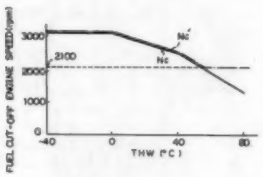
Kiago Horii, and Takatoshi Masui, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 14, 1983, Ser. No. 561,517

Claims priority, application Japan, Apr. 4, 1983, 58-57778

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—325 **4 Claims**



1. A method for controlling the fuel cut-off in an internal combustion engine having a throttle valve therein mounted on a four wheel drive (4WD) vehicle, comprising the steps of:

determining whether or not said throttle valve is completely closed;

calculating the fuel cut-off engine speed in accordance with the coolant temperature of said engine;

calculating the fuel cut-off recovery speed in accordance with the coolant temperature of said engine;

determining whether said vehicle is in a 4WD mode or in a 2WD mode;

setting predetermined minimum values in said calculated fuel cut-off engine speed and said calculated fuel cut-off recovery engine speed when said vehicle is in the 4WD mode;

determining whether or not the fuelcut-off operation is performed upon said engine;

comparing the current engine speed with said calculated fuel cut-off engine speed, when said throttle valve is completely closed and the fuel cut-off operation is not performed;

comparing the current engine speed with said fuel cut-off recovery engine speed, when said throttle valve is completely closed and the fuel cut-off operation is performed;

causing the fuel-injection time period to be zero when said throttle valve is completely closed, and it is determined that the current engine speed is higher than said calculated fuel cut-off engine speed or said calculated fuel cut-off recovery engine speed; and

calculating a fuel-injection time period based upon predetermined engine parameters, when said throttle valve is not completely closed, or when said throttle valve is completely closed and it is determined that the current engine speed is lower than said calculated fuel cut-off engine speed or said calculated fuel cut-off recovery engine speed.

3. An apparatus for controlling the fuel cut-off in an internal combustion engine having a throttle valve therein mounted on a four wheel drive (4WD) vehicle, comprising:

means for determining whether or not said throttle valve is completely closed;

means for calculating the fuel cut-off engine speed in accordance with the coolant temperature of said engine;

means for calculating the fuel cut-off recovery speed in accordance with the coolant temperature of said engine;

means for determining whether said vehicle is in a 4WD mode or in a 2WD mode;

means for setting predetermined minimum values in said calculated fuel cut-off engine speed and said calculated fuel cut-off recovery engine speed when said vehicle is in the 4WD mode;

means for determining whether or not the fuel cut-off operation is performed upon said engine;

means for comparing the current engine speed with said calculated fuel cut-off engine speed, when said throttle valve is completely closed and the fuel cut-off operation is not performed;

means for comparing the current engine speed with said fuel cut-off recovery engine speed, when said throttle valve is completely closed and the fuel cut-off operation is performed;

means for causing the fuel-injection time period to be zero, when said throttle valve is completely closed and it is determined that the current engine speed is higher than said calculated fuel cut-off engine speed or said calculated fuel cut-off recovery engine speed; and

means for calculating a fuel-injection time period based upon predetermined engine parameters, when said throttle valve is not completely closed, or when said throttle valve is completely closed and it is determined that the current engine speed is lower than said calculated fuel cut-off engine speed or said calculated fuel cut-off recovery engine speed.

4,506,639

METHOD AND SYSTEM FOR CONTROLLING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE AT VARIABLE IGNITION TIMING

Kazuhiro Murakami, Kamifukuoka; Hisamitsu Yamazoe, Kariya, and Toshiaki Mizuno, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 31, 1983, Ser. No. 462,544

Claims priority, application Japan, Jan. 29, 1982, 57-13898

Int. Cl.³ F02D *37/02*

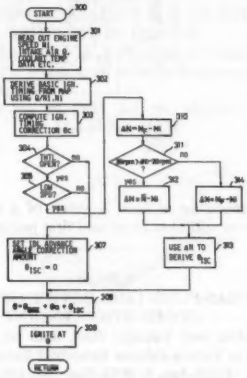
U.S. Cl. 123—339 **13 Claims**

1. A method for controlling the idle speed of an internal combustion engine having means for causing ignition to occur

in said engine at variable ignition timing, comprising the steps of:

(a) detecting when said engine is in idle state;

(b) detecting the magnitude of a variation of the speed of said engine in response to the step (a), the step (b) including a step of detecting the difference between an average



engine speed of a plurality of measurements and a latest instantaneous engine speed; and

(c) adjusting said variable ignition timing as a function of the detected magnitude of engine speed variation in a direction toward reducing the magnitude of subsequently occurring engine speed variation.

4,506,640

SYSTEM FOR REGULATING THE IDLE SPEED OF AN INTERNAL COMBUSTION ENGINE

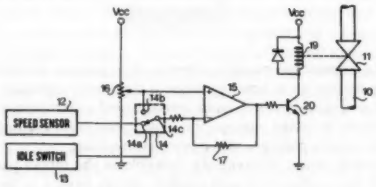
Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,886

Claims priority, application Japan, Nov. 12, 1982, 57-198760

Int. Cl.[3] **F02D** *11/10, 1/04;* **F02M** *51/06*

U.S. Cl. 123—339 **8 Claims**



1. A system for regulating the idle speed of an internal combustion engine with an electronic fuel injection system having a bypass around a throttle valve of the engine and a solenoid operated control valve provided in the bypass to control the volume of air flow passing through the bypass, comprising:

means for sensing the engine speed of said engine and for producing an engine speed voltage;

an idle switch responsive to idle operation of said engine for producing an idle signal;

means comprising a reference voltage circuit for producing a reference voltage corresponding to a predetermined idle speed;

an operational amplifier having a feedback resistor for producing a control voltage dependent on the difference between said engine speed voltage and said reference voltage;

switch means responsive to said idle signal for applying said engine speed voltage to said operational amplifier; and

a driver responsive to said control voltage for energizing a solenoid of said solenoid operated control valve to actuate said control valve to regulate the idle speed to the predetermined idle speed.

4,506,641

IDLING RPM FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

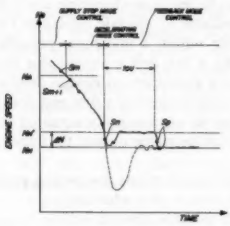
Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1984, Ser. No. 581,255

Claims priority, application Japan, Feb. 25, 1983, 58-30458

Int. Cl.[3] **F02D** *31/00*

U.S. Cl. 123—339 **6 Claims**



1. A method for controlling the quantity of supplementary air being supplied to an internal combustion engine during idling operation thereof in a feedback manner responsive to the difference between actual engine rpm and desired idling rpm, said engine having an intake passage, and a throttle valve arranged in said intake passage, said method comprising the steps of:

(a) setting a provisional value of desired idling rpm which is larger than a proper value of said desired idling rpm by a predetermined amount, when said engine is operating in a decelerating condition with said throttle valve fully closed;

(b) determining whether or not a predetermined condition of feedback control for bringing the engine rpm to said provisional value of desired idling rpm is satisfied, said predetermined condition being satisfied when the actual engine rpm has decreased below said provisional value of desired idling rpm;

(c) controlling the quantity of supplementary air in a feedback manner responsive to the difference between said actual value of engine rpm and said provisional value of desired idling rpm for a predetermined period of time from the time it is determined in said step (b) that said predetermined condition of feedback control for bringing the engine rpm to said provisional value of desired idling rpm has been satisfied; and

(d) controlling the quantity of supplementary air in a feedback manner responsive to the difference between said actual value of engine rpm and said proper value of desired idling rpm, after the lapse of said predetermined period of time.

4,506,642

ELECTRIC GAS PEDAL

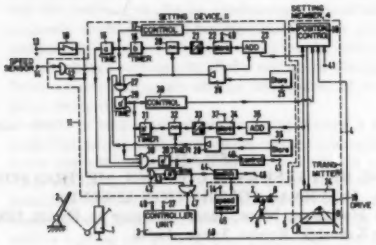
Manfred Pfalzgraf, Birstein, and Kurt Probst, Schwalbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,394

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149361

Int. Cl.[3] F02D 11/10

U.S. Cl. 123—361 15 Claims



1. In an electric gas pedal for an automotive vehicle comprising a desired-value transmitter from which an electric desired-value signal can be fed to an electronic controller unit, a setting member controllable by electric signals of the controller unit and displaceable within a maximum possible desired setting range limited by a first and a second end position, by which setting member a displacement device displaceable within an actual setting range limited by a first end position and a second end position can be mechanically actuated via a transmission unit for control of the motor power, the improvement comprising

a setting device and means for storing positions of the displacement device, and wherein

the maximum possible desired setting range is greater than the actual setting range and that, in the first end position and in the second end position of the displacement device, the position of the setting member can in each case be detected by said setting device and be stored by said storing means as effective desired setting range in the controller unit.

4,506,643

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Alfred Krappel, Ismaning; Johannes Guggenmos, Dirlewang, and Josef Holzmann, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Fed. Rep. of Germany

PCT No. PCT/EP81/00114, § 371 Date Apr. 9, 1982, § 102(e) Date Apr. 9, 1982, PCT Pub. No. WO82/00494, PCT Pub. Date Feb. 18, 1982

PCT Filed Aug. 5, 1981, Ser. No. 369,020

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030190

Int. Cl.[3] F02P 5/08

U.S. Cl. 123—418 16 Claims

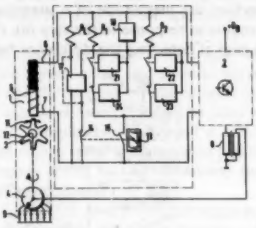
2. An ignition system for internal combustion engines having an ignition coil with primary circuit comprising

an inductive transducer means for timing control of the primary circuit of the ignition coil,

impedance means for varying the phase position of an output signal of the inductive transducer means for varying the instant of ignition,

first means for connecting at least a portion of the impedance means to the transducer means as an additional load in dependence on a first value of a first operating parameter of the engine, and

second means for performing at least one of connecting and disconnecting at least a portion of the impedance means in



dependence on at least a value of a second operating parameter different from said first parameter.

4,506,644

EXHAUST GAS-PURIFYING DEVICE OF AN INTERNAL COMBUSTION ENGINE

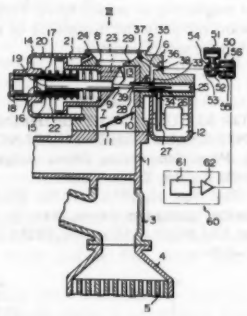
Takashi Katou, and Takaaki Itou, both of Mishima, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jan. 5, 1983, Ser. No. 455,798

Claims priority, application Japan, Jul. 7, 1982, 57-117016

Int. Cl.[3] F02M 9/06

U.S. Cl. 123—439 5 Claims



1. An exhaust gas-purifying device of an internal combustion engine having an exhaust passage, a three-way catalytic converter arranged in the exhaust passage, and a carburetor having therein an intake passage and a fuel passage for feeding fuel into the intake passage, said device comprising:

a suction piston transversely movable in the intake passage of said carburetor, said suction piston having a tip face defining a venturi portion and a raised wall formed on the inner wall of the intake passage at a position opposite said suction piston, the tip face of said suction piston having an upstream end portion which has a V-shaped cross-section expanding toward said venturi portion and which cooperates with the raised wall for defining an approximately isosceles triangle-shaped air flow restricting opening therebetween when the amount of air flowing within the intake passage is small:

an air-bleed passage connected to the fuel passage for feeding air into the fuel passage;

valve means arranged in said air-bleed passage for controlling the flow area of said air-bleed passage; and

control means for controlling the opening operation of said valve means to periodically open said valve means at a fixed frequency of one through two Hz, said air-bleed passage having a flow area which causes the air-fuel ratio of the fuel mixture formed in the intake passage to fluctu-

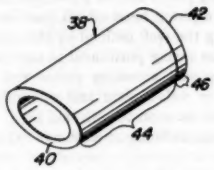
ate within the range of a ±0.2 A/F unit through a ±1.0 A/F unit relative to an approximately stoichiometric air-fuel ratio when said valve means is periodically opened.

4,506,645

LOAD CARRYING ASSEMBLY FOR AN INTERNAL COMBUSTION ENGINE

Robert W. Hewlitt; James H. Ruff, both of Cedar Falls, and Aubrey E. Haight, Hudson, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 10, 1983, Ser. No. 503,390
Int. Cl.³ F02M *61/14*
U.S. Cl. 123—470 **5 Claims**



1. A load carrying assembly for an internal combustion engine comprising:

(a) an engine block having a cylinder formed therein;

(b) a cylinder head mounted to said block and having a deck surface which closes off one end of said cylinder;

(c) a piston reciprocally mounted in said cylinder and cooperating with said deck surface to form a combustion chamber;

(d) a pair of intake and exhaust passages formed in said cylinder head, said passages terminating into adjacent intake and exhaust ports formed in said deck surface which communicate with said combustion chamber;

(e) a bridge section formed between the outer peripheries of said adjacent ports having a maximum length which is less than twice the diameter of the larger of said intake and exhaust ports, said bridge section further having a stepped nozzle bore formed at least partially therein and communicating with said combustion chambers, said stepped nozzle bore having at least one bore with a diameter less than the diameter of either of said respective ports; and

(f) a hollow cylindrical sleeve having first and second outer peripheral sections located between first and second ends, said second section having a slightly larger cross-sectional area than said first section, said sleeve being press fitted into a portion of said stepped bore with said first end positioned approximate flush with said deck surface and said second end being positioned approximate a step of said stepped bore, said sleeve being constructed of a material having a higher coefficient of thermal expansion and a greater stiffness than the material from which said cylinder head is constructed so as to be capable of serving as a load carrying member to reduce stress buildup within said bridge section and to reduce the initiation of thermal fatigue cracks in said bridge section.

4,506,646

ELECTRONIC CONTROLLED FUEL INJECTION SYSTEM AND INJECTION TIMING CONTROL METHOD THEREFOR

Masami Nagano; Takeshi Atago, and Tatsuya Yoshida, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,141
Claims priority, application Japan, Jul. 8, 1981, 56-105537
Int. Cl.³ F02M *39/00*; F02D *17/02*
U.S. Cl. 123—501 **5 Claims**

1. An electronic-controlled fuel injection system comprising:

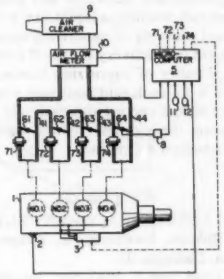
suction paths respectively communicating with four cylinders of an engine for four-cycle operation;

throttle valves disposed in said suction paths;

electronic control means for determining an amount of fuel to be injected into the respective cylinder on the basis of an amount of intake air drawn the engine; and

electromagnetic fuel injection valves disposed downstream of said throttle valves and controlled by said electronic control means;

wherein said electronic control means includes injection



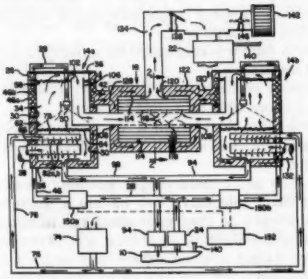
timing control means for controlling the fuel injection timing so that fuel is simultaneously injected at a first predetermined injection timing at each 360° in crankshaft angles of said engine into a reference cylinder and another cylinder having an operation cycle delayed by 360° from the reference cylinder and so that fuel is simultaneously injected at a second predetermined injection timing delayed at 180° from said first predetermined injection timing at each 360° into two cylinders whose respective operation cycles are delayed by 180° and 540° from that of said reference cylinder.

4,506,647

VAPOR FUEL SYSTEM INTERNAL COMBUSTION ENGINES

Harold L. Geddes, 3255 SE. Lewis Ct., Troutdale, Oreg. 97060, and Dell R. Beckstead, 3731 NE. Country Club Ave., Gresham, Oreg. 97030

Division of Ser. No. 268,712, Jun. 1, 1981, Pat. No. 4,458,653. This application Jun. 8, 1984, Ser. No. 618,874
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **13 Claims**



1. A fuel system for an internal combustion engine in which the system is provided with a source of liquid fuel, the system comprising:

plural vaporizing means for vaporizing liquid fuel delivered from said source,

plural first passage means, one in fluid communication with

each said vaporizing means and said source, said plural first passage means connecting said plural vaporizing means in parallel with said source for supplying liquid fuel from said source to said plural vaporizing means,

plural second passage means, one in fluid communication with each said vaporizing means for connecting said plural vaporizing means in parallel with said engine for supplying vaporized fuel from said vaporizing means to said engine,

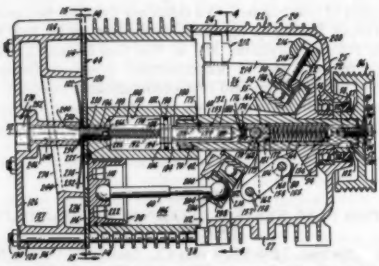
control means selectively operating each said vaporizing means independently of the others whereby each vaporizer is periodically activated and deactivated, such that under normal conditions liquid fuel is delivered to at least one of said plurality of vaporizing means for vaporization while liquid fuel delivery is cut off from at least one other of said plurality of vaporizing means, and fuel vapor is delivered from each said activated vaporizing means and any residual fuel vapor from each said deactivated vaporizing means through the second passage means to the internal combustion engine.

4,506,648

CONTROLLED DISPLACEMENT SUPERCHARGER

Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 1, 1982, Ser. No. 438,551
Int. Cl.[3] F02B *33/00*; F02D *23/00*; F04B *1/26*
U.S. Cl. 123—564 **14 Claims**



1. A controlled displacement supercharger having a longitudinal axis, and comprising:

a valve plate assembly defining a plurality of inlet ports and discharge ports;

a first means defining a central cylinder with a wall, and a plurality of fluid working spaces;

said valve plate coupled to said first means such that each fluid working space cooperates with at least one inlet port and one discharge port;

a piston in each working space for movement to compress a fluid therein;

an actuating piston slidably positioned in said central cylinder, and operable by a fluid pressure;

a rotating drive shaft having a rectangular cross-section and an axis coincident with the longitudinal axis of said supercharger;

a drive hub and counterweight assembly mounted on said drive shaft, said drive hub having a reference position perpendicular to the longitudinal axis of said drive shaft and said hub defining an oblong central opening;

means providing communication from said actuating piston to said drive hub mechanism to provide sliding motion thereto;

a wobble plate mounted around said hub; and means operably connected between said wobble plate and the pistons;

said means for communication from said actuating piston to move said wobble plate and hub mechanism along said drive shaft includes; said drive shaft defining a first and second end segment, said second end segment positioned in a first bearing assembly, a blind-hole bore open at said drive shaft first end segment and having a closed end; and, said drive shaft defining a cross-slot;

a second bearing assembly mounted in the end of said central cylinder opposite said valve plate assembly to receive said drive shaft first end segment;

a first bias spring positioned in said blind-hole bore against said closed end;

a plug slidable in said bore, abutting said first bias spring and defining a cross-hole therethrough alignable with said cross-slot;

said hub mechanism defines a through-hole alignable with the drive shaft cross-slot and the plug cross-hole to couple these members by a pin for movement in unison;

said actuating piston defines a stem to contact and move said plug and a piston head which head includes a seal means contacting the wall defined by the central cylinder;

a second bias spring positioned in said central cylinder and contacting said actuating piston and a securing means segment or valve plate and operable to maintain said piston stem in contact with said plug;

a thrust flange defining at least one extending flange member;

a pivot link with a first end and a second end and having said first end attached to said extending flange member and said second end attached to said drive hub at a position spaced from the axis of the drive shaft so that said drive hub mechanism is pivoted at a point not coincident with said drive shaft axis;

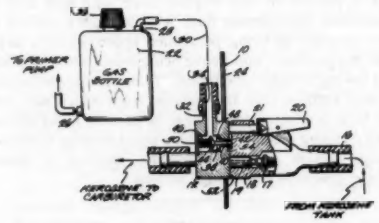
said actuating piston moves said drive hub mechanism longitudinally on said drive shaft to a second position which forms an acute angle relative to said reference position, which drive shaft at its rectangular cross-section corners delivers all the torque to drive said drive hub and thus drives said wobble plate in a nutating motion about said drive shaft axis.

4,506,649

VENT SYSTEM

Paul R. Hunt, Lindenhurst, and Chester G. DuBois, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 3, 1983, Ser. No. 538,761
Int. Cl.[3] F02B *1/00*
U.S. Cl. 123—576 **9 Claims**



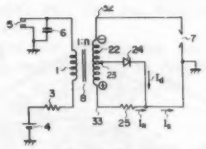
1. A fuel system for a dual fuel outboard motor, said system comprising an outboard motor having a fuel connector mounted thereon in position to have a second connector connected to it to enable fuel to be transferred to the motor from a fuel tank via a hose leading to the second connector, a second tank of starting fuel fixed to the motor, said second tank having a vent, and valve means operative to open and close said vent in response to connection and disconnection, respectively, of said fuel connector and the second connector.

4,506,650

IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

Hirokazu Shimojo, Akatsukashin, and Toshio Inamura, Tokyo, both of Japan, assignors to Kabushiki Kaisha Sigma Electronics Planning, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,253
Claims priority, application Japan, Jun. 5, 1982, 57-95615
Int. Cl.³ F02P 3/06, 1/00, 3/00
U.S. Cl. 123—620 9 Claims



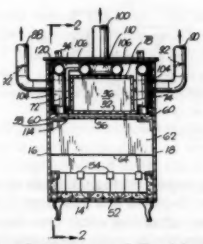
1. An ignition device for an internal combustion engine, comprising: an ignition coil having a primary winding and a secondary winding, an impedance element having one end connected to one end of the secondary winding and the other end connected to one of the terminals of a spark gap, a diode having one terminal connected to an intermediate-tap of the secondary winding and having the other terminal connected to the other end of the impedance elememt, and means for interconnecting the other terminal of the spark gap and the other end of the secondary winding, the diode being arranged in a forward direction with respect to a discharge current of the spark gap.

4,506,651

WOOD STOVE

Prudent R. Paradis, 307 Queen Mary St., Ottawa, Ontario, Canada K1K 1W8

Filed Sep. 12, 1983, Ser. No. 531,073
Claims priority, application Canada, Sep. 21, 1982, 411854
Int. Cl.³ F24C 1/14
U.S. Cl. 126—4 9 Claims



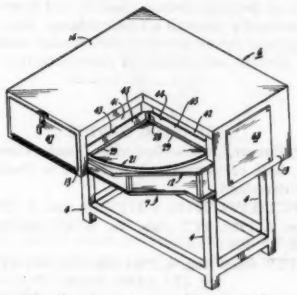
3. A wood burning stove as defined in claim 2, further including conduit means sealingly connecting the interior of said oven to the exterior of said housing and valve means in said conduit means for selectively controlling the rate of air flow through said conduit means.

4,506,652

PIZZA OVEN

Edward D. Baker, San Francisco; Nils Lang-Ree, Los Altos, and Ralph K. Johnson, Palo Alto, all of Calif., assignors to Nieco Corporation, Burlingame, Calif.

Filed Jan. 6, 1984, Ser. No. 568,784
Int. Cl.³ A21B 1/44
U.S. Cl. 126—21 A 5 Claims



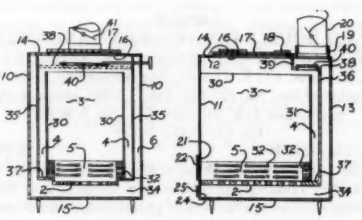
1. An automatic pizza oven comprising
(a) a frame,
(b) a generally circular pizza support mounted on the frame for rotation about a generally vertical axis,
(c) upstanding generally radial walls on said support dividing said support into a plurality of equal arcuate segments,
(d) housing means on said frame surrounding said support defining an oven area which encloses a plurality of the accurate segments and an access area on top of at least one of one of the segments with the housing means defining doorways between the oven and access areas and with the doorways closely interfitting with the radial walls whereby the radial walls form doors closing the doorways,
(e) closed circuit heating and circulating means for heating air in said oven area and circulating the heated air throughout the oven area, and
(f) intermittent drive means for starting rotation of the pizza support on the frame, rotating the pizza support through an integral multiple of the arcuate extent of one of said segments and then stopping rotation of the support.

4,506,653

COMBUSTION METHOD AND APPARATUS

Lavell M. Bigelow, 3820 Little Rock Dr., Provo, Utah 84604; Robert D. Bigelow, 900 N. 100 W., Pleasant Grove, Utah 84062, and William S. Bigelow, 3820 N. Little Rock Dr., Provo, Utah 84604

Filed Feb. 3, 1983, Ser. No. 463,642
Int. Cl.³ F24B 7/00
U.S. Cl. 126—69 11 Claims



1. A combustion method which comprises establishing

within a chamber having front, back and side walls a column of particulate fuel above a grate, establishing a burning zone at the lower end of the column of fuel in a zone adjacent to and above said grate, said column being surrounded by impervious and non-combustible walls above said burning zone which are spaced inwardly from said side and back walls of said chamber to provide a vertical air passageway, supplying all the combustion air downwardly through said vertical passageway and then only laterally into the burning zone over a substantial height thereof, withdrawing products of combustion downwardly through said combustion zone and said grate directly into a reduced pressure plenum chamber and from said plenum chamber upwardly through a heat exchange zone adjacent to said passageway by air pressure differential without passing upwardly through said column of particulate fuel.

4,506,654

HEATING DEVICE

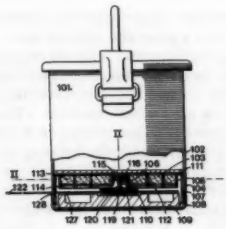
Conrad Zellweger, Chene-Bougeries, and Victor Spreter, Meinier, both of Switzerland, assignors to Pozel S.A., Fribourg, Switzerland

PCT No. PCT/EP81/00112, § 371 Date Apr. 4, 1983, § 102(e) Date Apr. 4, 1983, PCT Pub. No. WO83/00425, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 4, 1981, Ser. No. 491,427

Int. Cl.³ A47G *23/04*

U.S. Cl. 126—262 **22 Claims**



1. A heating device for heating liquid and solid products comprising a container structure and heating means located at the base of the container structure, said heating means comprising a heating element including a supply of exothermic gas-less combustible material characterized in that said heat element consists of a flat tile like three-layer element comprising a first heat spreading layer made of heat conducting material, a second, intermediate layer composed of said exothermic gas-less combustible material, and a third layer made of heat insulating incombustible material, ignition means being in operable contact with said combustible material through an opening in at least one of said first and second layers encasing the combustible material and, said heating element further comprising walls arranged throughout said second layer substantially perpendicular to said first layer and dividing said combustible material to define at least one fire path extending from said opening for said ignition means.

4,506,655

COMPACT DOUBLE FAN APPARATUS AND METHOD WITH GREASE-SEPARATING CAPABILITIES

Irvin R. K..achler, 172 E. 27th St., San Bernardino, Calif. 92402

Continuation of Ser. No. 231,136, Feb. 3, 1981, abandoned. This application Feb. 10, 1984, Ser. No. 578,598

Int. Cl.³ A47J *36/38*

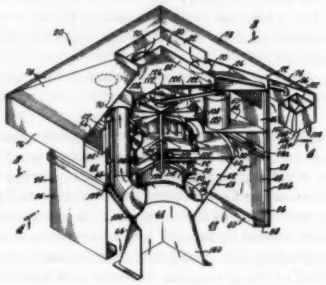
U.S. Cl. 126—299 D **20 Claims**

15. The combination with an exhaust hood adapted to be mounted over cooking appliances in a kitchen, said exhaust hood being of the type in which grease-laden fumes are exhausted upwardly from the hood to the ambient atmosphere and makeup air is supplied downwardly to the hood from the ambient atmosphere, of a double fan apparatus adapted to effect both said exhausting and said supplying, said double fan apparatus comprising:

(a) fan means having an upper impeller section and a lower impeller section mounted on shaft means,
each of said impeller sections being a centrifugal impeller,

(b) means to pass grease-laden fumes upwardly, from an exhaust duct connected to said exhaust hood, to said lower impeller section,

(c) conduit means, disposed radially-outwardly from said lower impeller section, to receive said fumes therefrom and conduct said fumes upwardly to the upper part of said double fan apparatus, and thence to the ambient atmosphere,



(d) means to conduct makeup air generally horizontally from the ambient atmosphere to said upper impeller section and then to conduct said makeup air generally horizontally from said upper impeller section to peripheral regions of said double fan apparatus, and

(e) means to conduit said makeup air downwardly from said peripheral regions to a supply duct connected to said exhaust hood,
said conduit means (c) comprising a plurality of separate conduits positioned outwardly of said fan means and spaced apart sufficiently far that makeup air may flow therearound to and from said upper impeller section as recited in clause (d).

4,506,656

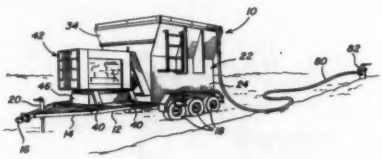
METHOD AND APPARATUS FOR LIQUEFYING SNOW

Richard H. Bassch, Box 1, Hazard, Nebr. 68844

Continuation-in-part of Ser. No. 396,070, Jul. 7, 1982, abandoned. This application Dec. 19, 1983, Ser. No. 563,177

Int. Cl.³ E01C *19/45*; F24H *1/00*

U.S. Cl. 126—343.5 R **5 Claims**



1. A snow melting apparatus including an upwardly opening tank, agitator means disposed in a lower portion of said tank, water inlet means for admitting water into the interior of said tank at a predetermined rate, water outlet means for discharging water from said tank at a level spaced above said lower portion, motor means disposed exteriorly of said tank for driving said agitator means, said agitator means including a plurality of parallel shafts journalled from said lower portion of said tank, said shafts including bladed propeller means thereon, said

motor means being drivingly connected to said shafts, said propeller means including a plurality of bladed propellers spaced longitudinally on each of said shafts, the blades of at least two of the propeller means on said shafts being of opposite pitch and said shafts each being driven in a direction in which the two propeller means thereon pump water in said tank toward each other.

4,506,657

SAUCEPAN, PARTICULARLY FOR USE BY DISABLED PERSONS

Sten Trolle, Skansgränd 7, S-271 00 Ystad, Sweden

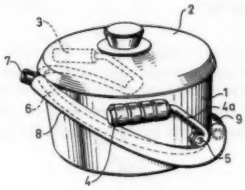
PCT No. PCT/SE82/00386, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01732, PCT Pub. Date May 26, 1983

PCT Filed Nov. 15, 1982, Ser. No. 505,034

Claims priority, application Sweden, Nov. 13, 1981, 8106766

Int. Cl.³ A47J *27/00*

U.S. Cl. 126—373 **2 Claims**



1. A saucepan, particularly adapted to be used by disabled persons, comprising:

(a) a saucepan vessel (**1**) having a bottom portion and a generally cylindrical sidewall upstanding therefrom,

(b) a semi-circular yoke (**6**) surrounding a portion of the vessel, pivotably mounted thereto at spaced points (**5**) proximate the bottom portion thereof, and having end arms (**4a**) extending back beyond the pivot points and terminating in handles (**3, 4**), and

(c) a drain conduit (**8**) having an inlet end (**9**) in communication with the bottom portion of the vessel and an outlet end (**7**) measured to the yoke intermediate the pivot points, whereby when the saucepan is carried by the handles the outlet end of the conduit is retained in a raised position proximate an upper rim of the sidewall, and when the yoke is pivoted downwardly by depressing the handles the outlet end of the conduit is lowered to a drain position proximate the bottom portion of the vessel.

4,506,658

PERICARDIAC CIRCULATORY ASSISTANCE DEVICE

Jean P. Casile, La Cote d'Hyot, Bonneville (Haute Savoie), France

Filed Jan. 7, 1983, Ser. No. 456,343

Claims priority, application France, Jan. 11, 1982, 82 00649

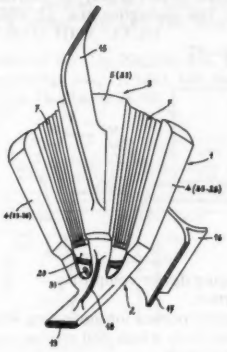
Int. Cl.³ A61B *19/00*; A61F *1/24*; A61H *31/00*

U.S. Cl. 128—1 D **12 Claims**

1. A pericardial circulatory assistance device, comprising in combination:

a structure of generally truncated conical shape adapted to be positioned periventricularly in the human body, said structure being provided with electromechanical means for exerting alternating external stress, and mechanical means for maintaining the stress;

a double, right and left, hydraulic drive unit positioned inside said structure, each of the right and left of said double hydraulic drive unit being in hydraulic circuit with a corresponding fluid-receiving sac positioned inside said structure, said double, right and left, hydraulic drive unit and the corresponding fluid-receiving sacs being in a closed circuit comprising pumping means mechanical fastening means carried by said structure for securing said structure in implanted relation to the human body;



electronic control means governing the functioning chronology of the alternating external stress and of said double hydraulic drive unit; and

an implantable electric power source for said device.

4,506,659

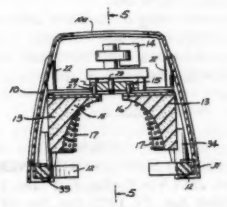
SCALP MASSAGER

Thomas M. Chester, 1719 Captain Shreve, Shreveport, La. 71105

Continuation of Ser. No. 415,575, Sep. 7, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 598,060

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—52 **11 Claims**



1. A massage device for massaging the scalp including,

a housing adapted to be positioned on the head of a user,

a pair of massaging elements mounted within the housing,

each massaging element having an internal curved surface adapted to engage a substantially large area of one side portion and part of the top of the head when the housing is in position,

means for mounting said massaging elements for reciprocating movement toward and away from each other within the housing and with respect to the scalp, wherein the points of attachment where said massaging elements are movably mounted with respect to the housing move toward and away from each other in the same horizontal plane and along a straight line,

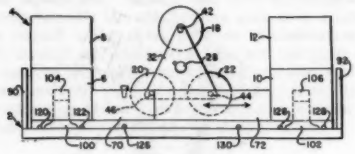
said massaging elements being of such size that when each is in its inward position the massaging elements co-act to substantially cover the top of the head, and

means for reciprocating said massaging elements toward and away from each other whereby such motion of said massaging elements shifts the areas of the scalp in contact with the massaging elements toward and away from each other to thereby massage the scalp.

4,506,660
MASSAGING DEVICE

William F. Curran, 85 Dobson Rd., Mars, Pa. 16046

Continuation-in-part of Ser. No. 264,432, May 18, 1981, abandoned. This application Mar. 22, 1982, Ser. No. 360,791
Int. Cl.³ A61H 15/00
U.S. Cl. 128—57 16 Claims

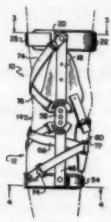


13. Massaging device comprising
a base portion,
a body support portion for supporting only that portion of an individual body which will receive massaging action,
a main drive shaft,
motor means for rotating said main drive shaft,
said main drive shaft being rotatably mounted a fixed distance from said base portion,
a plurality of roller members operatively associated with said main drive shaft for orbital movement therearound in a fixed path with respect to said base portion responsive to rotation of said main drive shaft, whereby a stationary individual supported by said body support portion with his or her cervical spine region in overlying contacting relationship with respect to said roller members will receive continuous massaging action applied to said region of the body,
said body support portion having a flexible web in overlying position with respect to said roller members,
said flexible web being secured in fixed position with respect to said base portion, and
said flexible web being of such size and shape as to provide effective support to said cervical spine, whereby said stationary individual will have said flexible web interposed between the cervical spine region and said roller members.

4,506,661
BALANCED SUSPENSION KNEE BRACE

Dean J. Foster, 2501 Via Torina, Del Mar, Calif. 92014

Filed Apr. 21, 1983, Ser. No. 487,269
Int. Cl.³ A61F 5/00
U.S. Cl. 128—80 C 13 Claims



1. A knee brace for constraining the knee to its natural position, and motion, said knee brace comprising:
first hinged bar means including upper and lower rigid bar members pivotally hinged together at one end thereof;
second hinged bar means including upper and lower rigid bar members pivotally hinged together at one end thereof;
a substantially rigid anterior femoral band securing said upper rigid bar members together;
a substantially rigid posterior tibial band securing said lower rigid bar members together;
a prepatellar pad;
antirotation strap means supporting said prepatellar pad from said upper rigid bar members;
flexible restraining strap means securing said prepatellar pad to said lower rigid bar members;
a pair of condylar pads secured to said upper bar members; and means for biasing said pads toward the condylar.

4,506,662
NAIL FOR FIXING A FRACTURE OF THE FEMUR

Emmanuel Anapliotis, Berlin, Fed. Rep. of Germany, assignor to Mecron medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 390,079
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1981, 3124059; Jul. 9, 1981, 3127378
Int. Cl.³ A61F 1/00, 5/04
U.S. Cl. 128—92 BC 7 Claims

1. An elastic nail for fixing a bone fracture of the femur, said nail comprising an elongated cylindrical rod having a distal end, a proximal end and an outer surface, said rod being curved along its length between said distal and proximal ends, the elasticity and curvature of said rod being such that when said rod is driven into the marrow cavity of the femur its distal end is supported by the cortical part of the bone, said rod having a circular cross section between its ends, with a region integral with said rod and adjacent its distal end having a cross section which differs from circular, said region having a concave face and a convex face which are curved predominantly about axes extending parallel to the lengthwise direction of said rod, said concave face defining a recess in the outer surface of said rod, said recess being disposed at the inside of the curvature which relates to the entire length of said rod, said convex face extending only in part slightly beyond said circular cross section transverse to the longitudinal direction of said rod to form edge regions each of which has a continuously curved surface joining said convex face to said concave face thereby preventing chisel-like pressure onto the cortical part of the bone.

4,506,663
FINGER SUCKING PREVENTIVE DEVICE

Walter Baron, 28 Bayville Park Blvd., Bayville, Long Island, N.Y. 11709

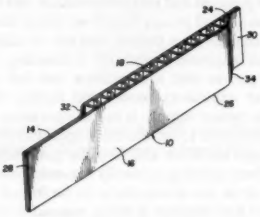
Filed Sep. 30, 1982, Ser. No. 432,094
Int. Cl.³ A61F 13/00
U.S. Cl. 128—133 3 Claims

1. A finger sucking preventive device comprising:
two elongate strips of flexible adhesive material arranged in parallelism whereby respective interior adhesive sides thereof are opposingly arranged in spaced superposed relation;
a continuous elongate, flexible corrugated element extending lenthwise between said strips and having its corrugations

extending transversely thereof to form air passages therethrough, said corrugated element adhering to said respective interior adhesive sides of said strips;

said corrugations being formed by curved sections on one side of said corrugated element connected by flat sections on the other side;

an adhesively coated tab extending from each end of said device; and



an adhesive coating over the exterior surface of the strip adjacent said flat sections of said corrugated element;

whereby said device can be applied peripherally of a finger and retained therearound in the form of a loop with said flat sections of said corrugated element on the inside of said loop.

4,506,664

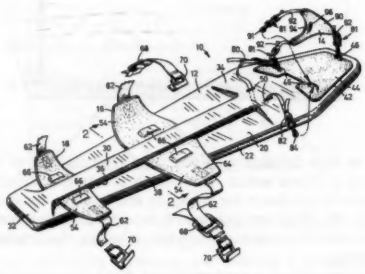
SPINEBOARD

Richard A. Brault, 17 Pembroke St., Apt. 11, Toronto, Ontario, Canada M5A 2N6

Filed Mar. 30, 1983, Ser. No. 480,340

Int. Cl.[3] A61F *5/04*

U.S. Cl. 128—134 **13 Claims**



1. A spineboard comprising:

(a) a body supporting board having a length and width proportioned to provide underlying support for a prostrate patient and a slipway formed substantially centrally of the width thereof, and extending longitudinally along a major portion of the length thereof,

(b) a body restraint harness comprising at least two lengths of flexible material each having a proximal end mounted on the board at said slipway so as to permit longitudinal movement of said proximal ends with respect to the board while preventing lengthwise movement of the proximal ends of each end with respect to the board, each length having a sufficient extent to extend from the proximal end in a first direction and around the body of a patient to be secured to the board at a point spaced from the proximal end in a second direction opposite said first direction whereby each length may form a body sling which extends in opposite directions about a patient.

4,506,665

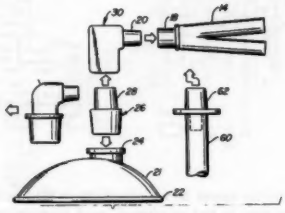
ANESTHETIC SUPPLY VALVE AND ADAPTER FOR MASKS

E. Trent Andrews, 2 Northgate Dr., San Francisco, Calif. 94127; Steve R. Lamb, 2772 Sydney Way, Castro Valley, Calif. 94546, and Robert R. Moore, 4010 East Ave., Hayward, Calif. 94542

Continuation-in-part of Ser. No. 268,918, Jun. 1, 1981, abandoned. This application Jan. 11, 1983, Ser. No. 457,125

Int. Cl.[3] A61M *16/00*

U.S. Cl. 128—202.27 **10 Claims**



1. An anesthetic supply system, safety valve coupler for selectively connecting a conventional anesthetic hose fitting to anesthetic gas delivery means adapted to be connected to a breathing passage of a patient, said valve coupler comprising:

anesthetic gas delivery means adapted to be connected to a breathing passage of a patient and having a gas inlet port, an adapter member having a first end including means connected to said gas inlet port of said delivery means and a second end and a fluid passage between said first and second ends; a valve member having a first end with connector means for connecting said valve member to a conventional hose fitting of an anesthetic supply system and a second end with connector means for connecting said valve member to the second end of said adapter member, said valve member including an internal valve means with an acutuator member contacting the second end of said adapter member for opening said valve means on connection of said valve member to the adapter member, and closing said valve means on disconnection of said valve member from the adapter member, said adapter member being proximally located with respect to said delivery means when connected for minimizing gas contamination of the environment when said adapter member and delivery, means are separated.

4,506,666

METHOD AND APPARATUS FOR RECTIFYING OBSTRUCTIVE APNEA

Gerald Durkan, Altoona, Pa., assignor to Kircaldie, Randall and McNab, Wethersfield, Conn.

Filed Dec. 3, 1982, Ser. No. 446,543

Int. Cl.[3] A61M *16/00*

U.S. Cl. 128—204.23 **21 Claims**

1. An apparatus for sensing, negative pressure indicative of inspiration in an in vivo respiratory system and for supplying gas to said in vivo respiratory system, said apparatus comprising:

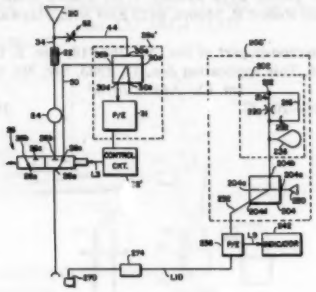
means for sensing negative pressure in said in vivo system;

valve means operable for selectively supplying said gas to said in vivo system;

control means responsive to said sensing means for operating said valve means whereby said gas is supplied to said in vivo system for at least a portion of the time duration of an occurrence of sensed negative pressure;

first timer means connected to said sensing means for determining when a first predetermined time interval has elapsed since the last occurrence of negative pressure in said in vivo system; and,

means responsive to said first timer means for stimulating a nerve associated with upper airway in vivo neuro-muscular tissue that will displace said tissue when stimulated



whereby an upper airway passage in said in vivo respiratory system is not occluded, said stimulation occurring upon the elapse of said predetermined time interval.

4,506,667

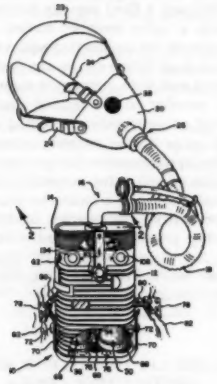
SELF-CONTAINED VENTILATOR/RESUSCITATOR

William K. Ansite, 1212 N. Jackson St., Glendale, Calif. 91207

Filed Apr. 6, 1983, Ser. No. 482,621

Int. Cl.³ A62B 7/10

U.S. Cl. 128—204.25 **10 Claims**



1. A self-contained portable ventilator/resuscitator adapted to be used with a patient and being capable of operating in a normal mode during operation of a power supply to cyclically force filtered air and oxygen into the lungs of a patient and to then permit the patient's respiratory cavity to expire, said ventilator/resuscitator also being capable of being operated manually if the power supply should fail; said ventilator/resuscitator comprising:

a filter having a filter inlet open to ambient air and a filter outlet;

a power supply in the form of a source of pressurized oxygen;

pump means having a suction portion operatively interconnected with said filter outlet and a discharge portion, said pump means also being operatively interconnected to said power supply, the pump means being capable of being operated when powered by said pressurized oxygen to cause ambient air to be drawn through said filter and into said pump through said suction portion, the filtered air to be mixed with said oxygen within said pump, and the filtered air and oxygen to be discharged through said discharge portion;

outlet tubing interconnectible with said discharge portion and adapted to be connected to a patient;

an expansible and retractable accumulator, said accumulator being provided with hand engageable means which is capable of being engaged manually to cause said accumulator to be expanded or retracted; and

control means normally operatively interconnected with said pump means and said accumulator and capable during operation of said power supply of either directing filtered air and oxygen to a patient and not to said accumulator during an inspiratory mode or of directing the filtered air and oxygen to said accumulator and not to the patient during an expiratory mode, and further being capable, when the power supply is not in operation, of permitting the accumulator to be manually operated to draw ambient air through the filter and into the accumulator when the accumulator is being manually expanded and to permit the filtered air in the accumulator to be forced into a patient when the accumulator is being manually retracted.

4,506,668

INSULATED SLEEVE HIGH FREQUENCY RESECTOSCOPE

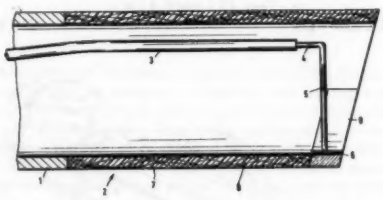
Helmut König, Diemelstadt, Fed. Rep. of Germany, assignor to Olympus Winter & Ibe GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 505,999

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223361

Int. Cl.³ A61B 17/32

U.S. Cl. 128—303.15 **14 Claims**



1. A high frequency cutting loop resectoscope of the type having a sleeve and a loop which is movable relative to a portion of the sleeve for engaging and excising tissue therebetween, the distal end portion of the sleeve being formed from an electrical insulating material, wherein the improvement comprises

forming at least a portion of said distal end of said sleeve in the area most closely approached by said loop from a polymeric body including means comprising fibers of a highly heat resistant and abrasion resistant ceramic material of high thermal conductivity for conveying heat away from the end of said sleeve and to the surrounding material to dissipate the damaging effect of the heat at said end.

4,506,669

SKIN APPROXIMATOR

Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840

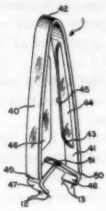
Filed Sep. 22, 1982, Ser. No. 421,563

Int. Cl.³ A61B 17/04, 17/30; B25B 9/02

U.S. Cl. 128—334 R **17 Claims**

1. A medical device, particularly a skin approximator, comprising first means for engaging the skin at opposite sides of a wound; second means for drawing the skin together by way of said first means across the wound so as to close the same; third means for everting the edges of the skin by way of said first means before the edges move into a position of mutual abut-

ment in response to operation of said second means, said first means being provided on said second means; means for mov-



ably connecting said second means with said third means; and means for facilitating disengagement of said first means from the skin.

4,506,670

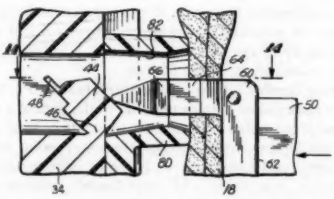
TWO-PART SURGICAL FASTENER APPLYING APPARATUS WITH FRANGIBLE MEMBER

Ronald L. Crossley, Wallingford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Mar. 30, 1983, Ser. No. 480,424

Int. Cl.³ A61B *17/04*; B31B *1/00*

U.S. Cl. 128—334 R **9 Claims**



1. An apparatus for applying a surgical fastener made up of two interlocking parts comprising:

a fastener including a fastener part having a prong which passes through the tissue to be fastened and a retainer part for interlocking with the end of the prong after it has passed through the tissue to prevent the prong from being subsequently withdrawn from the tissue,

a first member for supporting the retainer part prior to and during interlocking of the prong and the retainer part;

a second member connected to the first member and movable between a first position in which the second member engages the retainer part to secure the retainer part to the first member, and a second position in which the second member releases the retainer part from the first member, the second member being contacted and moved from the first position to the second position by the prong as the prong interlocks with the retainer part; and

a frangible member initially connected between the first and second members, the frangible member breaking when the second member moves from the first position to the second position in response to the prong contacting the second member and interlocking with the retainer part.

4,506,671

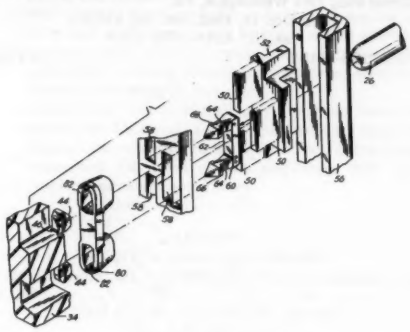
APPARATUS FOR APPLYING TWO-PART SURGICAL FASTENERS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Mar. 30, 1983, Ser. No. 480,566

Int. Cl.³ A61B *17/04*; B31B *1/00*

U.S. Cl. 128—334 R **21 Claims**



1. An apparatus for applying a surgical fastener made up of two interlocking parts comprising:

a fastener including a fastener part having a prong which passes through the tissue to be fastened and a retainer part for interlocking with the end of the prong after it has passed through the tissue to prevent the prong from being subsequently withdrawn from the tissue; and

a structure for releasably supporting the retainer part prior to interlocking of the prong and the retainer part, the supporting structure including a deformable part for releasably engaging the retainer part, the deformable part being contacted and deformed by the prong as the prong interlocks with the retainer part, and the deformable part responding to such deformation by releasing the retainer part.

4,506,672

SHEATHED SURGICAL SUTURE FILAMENT AND METHOD FOR ITS PREPARATION

Daniel Bichon, Gaillard, France, assignor to Assut S.A., Carouge-GE, Switzerland

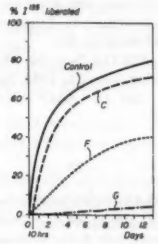
PCT No. PCT/EP80/00145, § 371 Date Jun. 30, 1981, § 102(e) Date Jun. 30, 1981, PCT Pub. No. WO81/01368, PCT Pub. Date May 28, 1981

PCT Filed Nov. 21, 1980, Ser. No. 279,972

Claims priority, application Switzerland, Nov. 23, 1979, 10449/79

Int. Cl.³ A61L *17/00*

U.S. Cl. 128—335.5 **10 Claims**



1. A catgut suture filament comprising a catgut core coated with an adherent protective sheath made of a polyester based

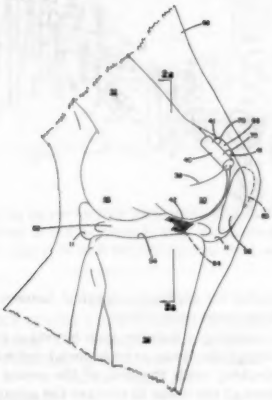
flexible resin reinforced by urea or urethane links, the sheath being hydrolytically but not enzymatically degradable.

4,506,673

THERAPEUTIC TREATMENT WITHIN JOINT CAPSULES OF THE BODY

Leonard J. Bonnell, Huntingdon Valley, Pa., assignor to Rorer Group Inc., Fort Washington, Pa.

Filed Oct. 18, 1982, Ser. No. 434,951
Int. Cl.³ A61N 1/20, 1/04
U.S. Cl. 128—419 F **25 Claims**



1. A method for stimulating formation of tissue in a living being within a joint capsule comprising the steps of:

Providing means for conducting electrical current comprising at least an anode terminal and a cathode terminal,

introducing at least the cathode terminal into said joint capsule from the exterior through a puncture in the flesh of the living being,

under visual control of an arthroscope introduced into said joint capsule via a puncture in the flesh, juxtaposing said cathode terminal in close relationship to the region within said joint capsule where said tissue growth is desired,

positioning said anode terminal at a location remote from but in substantial electrical continuity, through body tissue, with said cathode terminal.

connecting an electric power supply means between said anode and cathode terminal,

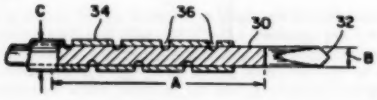
said steps being adapted to cause electrical current to flow between said terminals, through said region of the body to stimulate growth of tissue thereon.

4,506,674

METHOD OF STIMULATING OSTEOGENESIS WITH DISTRIBUTED PORT CATHODE

Carl T. Brighton, Malvern, and Jonathan Black, King of Prussia, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 320,110, Nov. 10, 1981, Pat. No. 4,442,846. This application Dec. 22, 1983, Ser. No. 564,215
Int. Cl.³ A61N 1/18
U.S. Cl. 128—419 F **8 Claims**



1. A method of stimulating osteogenesis in the vicinity of a human fracture site, said method comprising the steps of:

providing at least one cathode comprising a biocompatible conductor means for conducting current, a biocompatible non-conducting means for partially insulating said conductor means, said insulating means including means defining at least two ports in said insulating means, each of said ports exposing a portion of said conductor means;

providing an anode;

locating said ports of said at least one cathode in the vicinity of said fracture site and locating said anode remote from said fracture site; and

causing a direct current to flow between said at least one cathode and said anode with stimulation of osteogenesis at each of said at least two ports.

4,506,675

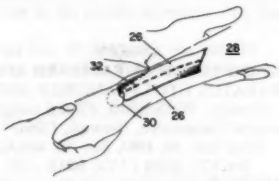
Patent Not Issued For This Number

4,506,676

RADIOGRAPHIC LOCALIZATION TECHNIQUE

Alois A. Duska, 2160 Via Olivera, Palos Verdes Estates, Calif. 90274

Filed Sep. 10, 1982, Ser. No. 416,489
Int. Cl.³ G03B 41/16
U.S. Cl. 128—653 **4 Claims**



1. A method for the medical examination and radiographic diagnosis of possible fractures or other medical problems, comprising the steps of:

initial examination of the patient;

securing flexible adhesive tape provided with a fine repetitive radiopaque pattern material to the patient's skin at the time of the initial examination, to locate critical areas such as tenderness, sensitivity or the entry point for foreign objects, said adhesive tape being of conventional type of medical tape formed of very flexible material provided with a series of evenly spaced unique radiopaque dots or other fine identifiable radiopaque indications to preclude possible confusion with foreign objects in the patient's body;

directing X-rays to the critical area of the patient as identified by the adhesive material and the fine radiopaque pattern and forming a visible image from the transmitted X-radiation; and

viewing said visible image wherein the image of the fine radiopaque pattern indicates the areas to which primary attention should be directed;

whereby the original examining physician may identify the critical local area deserving primary attention by subsequent viewers of the X-ray images who may not have had the opportunity of examining the patient.

4,506,677

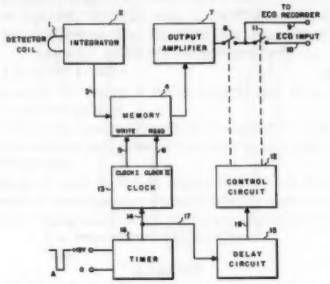
INDICATING DEVICE FOR DEFIBRILLATORS

Willibrordus J. S. Lambert, Eersel, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 21, 1982, Ser. No. 452,181
Int. Cl.³ A61B 5/04
U.S. Cl. 128—697 **9 Claims**

1. An indicating device for a defibrillator, characterized by a coupling means for producing an electrical signal corre-

sponding to a defibrillator current applied to a patient; a memory means for receiving and storing the electrical signal; a memory operation control circuit means for writing the signal into the memory means and for reading the signal from the



memory means to produce a time extension of the signal and a control circuit means for selectively applying the time extension of the signal to an indicating means and which, for the duration of an indication of the time extended signal, interrupts the display of an ECG of the patient on the indicating means,

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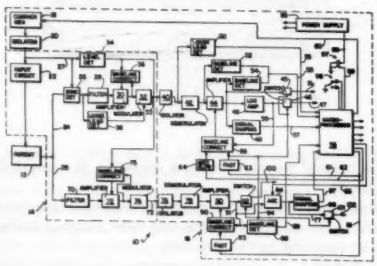
4,506,678

PATIENT MONITOR FOR PROVIDING RESPIRATION AND ELECTROCARDIOGRAM SIGNALS

Donald J. Russell, Kennesaw, and Michael A. Sanders, Woodstock, both of Ga., assignors to Healthdyne, Inc., Marietta, Ga.

Continuation-in-part of Ser. No. 386,187, Jun. 7, 1982,. This application Jul. 9, 1982, Ser. No. 396,837
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—723 **52 Claims**



1. A patient monitor comprising:

a patient unit comprising:

a probe connected to receive a carrier signal, said probe being adapted for connection to the body of a patient to be monitored, whereby said carrier signal is modulated in accordance with respirations of said patient to produce a modulated carrier signal;

carrier detection means connected to receive said modulated carrier signal and produce a demodulated respiration signal;

first baseline correction circuit means for altering the D.C. level of said demodulated respiration signal, said first baseline correction circuit means including means for sensing a variation in the level of said carrier signal and adjusting the DC level of said demodulated respiration signal in response to said variation; and

modulation means for receiving and modulating said demodulated respiration signal to produce a second modulated respiration signal; and

an analysis unit comprising:

carrier generation means for producing said carrier signal;

a demodulation circuit for receiving said second modulated respiration signal and demodulating said second modulated respiration signal thereby producing a respiration data signal;

an output circuit connected to receive said respiration data signal, amplify and level shift said respiration data signal, and output said respiration data signal;

isolation means for electrically isolating said patient unit from said analysis unit, said isolation means providing communication links for passing said carrier signal to said patient unit and said second modulated respiration signal to said analysis unit; and

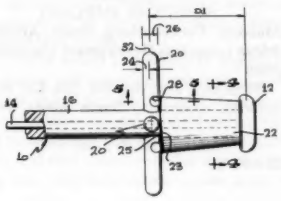
a baseline reset circuit including level sensing means for sensing the DC level of said respiration data signal and causing said variation in the level of said carrier signal when said DC level of said respiration data signal reaches a predetermined level.

4,506,679

ENDOCARDIAL ELECTRODE

Alfred E. Mann, 301 S. Cliffwood Ave., Los Angeles, Calif. 90049

Filed Sep. 30, 1982, Ser. No. 430,912
Int. Cl.³ A61N *1/02*
U.S. Cl. 128—785 **23 Claims**



1. In an endocardial electrode of the type having an electrical conductor encased in an encasing material which is generally inert to body fluids, the conductor terminating at an exposed electrically conductive electrode tip, the improvement comprising:

resilient tine means near the electrode tip comprising at least one tine for cooperating with heart tissue and holding the electrode tip in position, said tine exhibiting a first deformation resistance when said tine tip is moved away from the electrode tip, and

means for blocking the movement of a portion of said tine as said tine tip is moved towards the electrode tip, thereby providing a second deformation resistance which is greater than said first deformation resistance.

4,506,680

DRUG DISPENSING BODY IMPLANTABLE LEAD

Kenneth B. Stokes, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 17, 1983, Ser. No. 476,436
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—786 **7 Claims**

1. A cardiac pacing lead comprising:

an elongated electrical conductor having a proximal and a distal end;

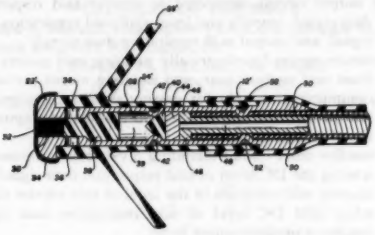
an insulative sheath covering said electrical conductor;

an electrical connector coupled to the proximal end of said electrical conductor;

an electrode having an exterior surface and coupled to the distal end of said electrical conductor; and

drug dispensing means for dispensing a drug at said electrode having a cavity for retaining said drug and an elu-

tion bore open to said cavity and to the exterior surface of said electrode, said drug dispensing means further comprising a plug of a swellable polymer located within said cavity containing a water soluble drug, said plug having a



volume smaller than the volume of the cavity of said drug dispensing means, the elution bore of said drug dispensing means having means for preventing expansion of said plug through said elution bore while permitting elution of the drug through said elution bore.

4,506,681

SURGICAL IMPLANT

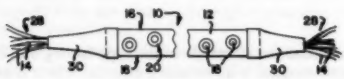
Peter J. Mundell, Verwoerdburg, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Oct. 26, 1982, Ser. No. 436,705

Claims priority, application South Africa, Nov. 11, 1981, 81/7811

Int. Cl.³ A61F *1/00, 5/04*

U.S. Cl. 128—92 D **13 Claims**



1. A precursor device for forming a surgical implant in the form of a bone prothesis which comprises a stiff moldable matrix of biocompatible thermoplastic electrically insulating material which material has sufficient rigidity for supporting bone in carrying out a load bearing function and within which is embedded a plurality of electrically conductive fibres, opposite ends of at least some of the fibres extending outwardly from the matrix and being exposed to provide electrical contacts which permit heating and softening of the matrix for shaping thereof, by the application of a suitable electric potential to said contacts.

4,506,682

CLEAR TOBACCO AROMA OIL, A PROCESS FOR OBTAINING IT FROM A TOBACCO EXTRACT, AND ITS USE

Adam Muller, Dr. Hans-Schack-Strasse 28, D-8630 Coburg, Fed. Rep. of Germany

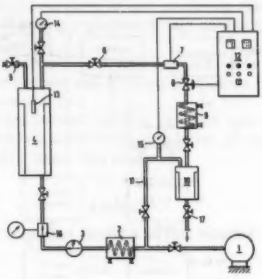
Filed Dec. 1, 1982, Ser. No. 445,929

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148335; May 18, 1982, 3218760

Int. Cl.³ A24B *15/24, 15/26*

U.S. Cl. 131—297 **17 Claims**

1. A process for obtaining aromatic materials from a tobacco extract, which comprises mixing a tobacco extract, which is obtained by extraction of tobacco with a solvent (primary extract), with an adsorbent, subjecting this mixture to a secondary extraction with CO_2 in a sealed pressure vessel (extraction vessel), and isolating in a second sealed pressure vessel (separating vessel) a clear tobacco aroma oil which can readily



be separated from resins and waxes and has a reduced nicotine content.

4,506,683

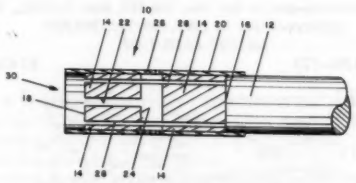
VENTILATED MOUTHPIECE FOR A SMOKING ARTICLE

Daniel V. Cantrell, and Robert A. Sanford, both of Prospect, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 9, 1983, Ser. No. 492,987

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **20 Claims**



1. A ventilated mouthpiece for a cigarette, the mouthpiece comprising:

a generally cylindrical core member fabricated of an air and smoke impermeable material, the core member having a smoke inlet end and mouth end;

means defining at least one ventilating air flow channel extending through at least a portion of the core member, the at least one air flow channel having an open outlet to the mouth end of the core member providing for the flow of only ventilating air therethrough to the outside of the core member at the mouth end;

means providing for the flow of only ventilating air into the at least one ventilating air flow channel;

means defining a plurality of smoke flow capillaries extending through the core member from the smoke inlet end to the mouth end of the core member, each smoke flow capillary being open to the smoke inlet end of the core member and having an open outlet to the mouth end of the core member providing for the flow therethrough of only smoke from the inlet end of the core member to the outside of the core member at the mouth end; and

the outlet openings of the smoke flow capillaries at the mouth end of the core member being located generally closer to the perimeter of the core member than the outlet opening of the at least one ventilating air flow channel at the mouth end of the core member.

4,506,684

MODIFIED CELLULOSIC SMOKING MATERIAL AND METHOD FOR ITS PREPARATION

Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 930,328, Aug. 2, 1978, Pat. No. 4,333,484.
This application Sep. 22, 1980, Ser. No. 189,891
Int. Cl.[3] A24B *15/24, 15/26, 15/28*
U.S. Cl. 131—369 25 Claims

1. A process for fixing a water-soluble salt in a cellulosic material comprising:

(a) providing an aqueous slurry of the cellulosic material and a water-soluble salt effective to impregnate said cellulosic material; and

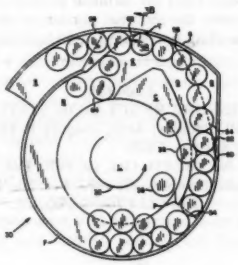
(b) adding to said slurry an ammonium or alkali metal salt capable of precipitating a cation of said water-soluble salt, thereby fixing said cation in the cellulosic material.

4,506,685

HIGH-SPEED COIN SORTING AND COUNTING APPARATUS

Roger K. Childers, 13320 SW. Ash, Tigard, Oreg. 97223; Kenneth L. Buchanan, 1540 SW. Clara, Troutdale, Oreg. 97060; Randall Barnette, 1331 NE. 16th Way, Gresham, Oreg. 97030, and Delbert L. Buchanan, 18027 SW. Belmore, Lake Oswego, Oreg. 97034

Filed Apr. 19, 1982, Ser. No. 369,907
Int. Cl.[3] G07D *3/06*
U.S. Cl. 133—3 A 40 Claims



1. A coin sorting and counting apparatus having a coin receiver for collecting coins after they have been sorted and counted, said receiver comprising a container with opposed end walls for holding a coin bag therein, said container having a pair of flaps for removably holding said coin bag in an open position, said flaps being pivotally mounted in opposed relationship, with one flap being mounted on each of the opposed end walls of said container and selectively and independently pivotable with respect to said container through a plane substantially perpendicular to said end walls between a first position, for holding a coin bag in an open position, and a second position, for permitting removal and replacement of a coin bag in said container, and a biasing means for biasing said flaps toward said first position.

4,506,686

PHYSIOCHEMICALLY CONTROLLED SCOUR JET ARRAY SYSTEM

James A. Bailard, Carpinteria, and Scott A. Jenkins, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 29, 1984, Ser. No. 584,834
Int. Cl.[3] B05B *12/12;* B08B *3/08;* B63B *59/04;* G05D *21/00*
U.S. Cl. 134—57 R 17 Claims

13. An improved scour jet array system for control and elimination of sedimentation accumulation in ship berthing areas and the like, comprising:

a. A series of submerged water scouring jet heads positioned near the bottom of a water area to be cleared of unwanted sediments;

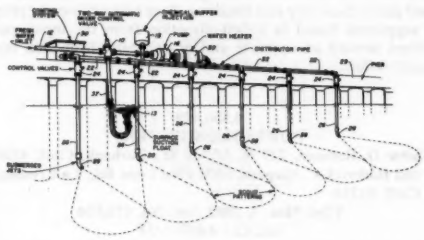
b. pump means for pumping warmer surface water from said water area to said jet heads;

c. control valves associated with said series of submerged jet heads for turning-on and shutting-off said jet heads;

d. means for adding and mixing fresh water with said surface water pumped to said jet heads;

e. means for adding chemicals to the scouring water for

f. means for sensing the salinity of intake water and of scouring water distributed to said jet heads;



g. means for sensing the pH of said surface water, said fresh water, and said scouring water distributed to the jet heads;

h. a system activation means;

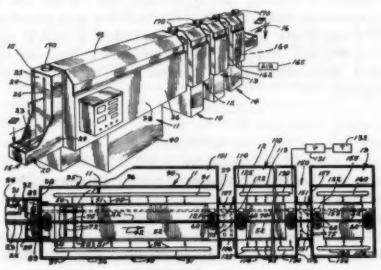
i. automatic control means responsive to signals from said activation means, said salinity sensing means, and said pH sensing means to initiate activation of the system and to control the operation of said control valves for said jet heads, said pump means, said means for adding and mixing fresh water, and said chemical buffer injection means, for controlling and removing sedimentation using minimum energy.

4,506,687

PRINTED CIRCUIT PROCESSING APPARATUS

Hubert J. Rosch, III, Long Lake, Minn., assignor to Circuit Services Corporation, Oak Brook, Ill.

Filed Jun. 10, 1982, Ser. No. 386,898
Int. Cl.[3] B05C *15/00;* H01L *21/68*
U.S. Cl. 134—83 15 Claims



1. Means for processing printed circuit boards in a wet process comprising a tank, pedestal means below and supporting said tank comprising means forming a sump and supply reservoir for liquids used in the tank, means within said tank for guiding boards to be processed in position so that the surfaces of a board are substantially vertical, a pair of input guide rollers rotatably mounted adjacent at least one end of said tank about vertical axes and being closely spaced to permit a board to be guided in a vertical position and driven toward the means for guiding, a plurality of spray heads positioned on opposite

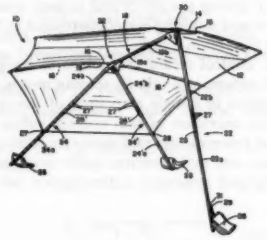
sides of said tank, and on opposite side of a board being guided by said means for guiding, pump means connected to said sump to provide liquid to said spray heads to spray a liquid on opposite sides of a board guided in the means for guiding simultaneously, drain means from said tank leading to said sump; cover means mounted on said tank and enclosing said tank, and means comprising a plurality of drive discs within said tank, mounted about generally parallel horizontal axes transverse to the direction of movement of a board in the means for guiding, the discs having their peripheries positioned adjacent each other for supporting a lower edge of a board being guided in said means for guiding on upper portions of the discs, said boards being supported under gravity in vertical direction on said drive discs only and the drive discs being driven to propel a supported board in a first direction from the input guide rollers toward an opposite end of said tank from said input guide rollers.

4,506,688

PORTABLE SHELTERS

Walter D. Bethoon, 219 N. Myers St., Burbank, Calif. 91505, and Roderick C. Shepard, 5408 Pine Cone Rd., La Crescenta, Calif. 91214

Filed Mar. 7, 1983, Ser. No. 472,904
Int. Cl.³ A45F *1/14*
U.S. Cl. 135—107 **15 Claims**



1. A portable, collapsible shelter comprising:
a flexible covering material;
a means for stretching said flexible covering material to a predetermined shape; and
a frame means for receiving and supporting said flexible covering material, said frame means including a tripod means for erecting and collapsing said shelter, and interconnecting means for pivotally securing said tripod means and said frame means further including a central support rod and said stretching means includes at least one stretch bow supported on said central support rod at one end thereof.

4,506,689

PORTABLE SUN SHELTER

Maurice K. Fiddler, 31 Hygeia Parade, Ringwood, Victoria, Australia

Continuation-in-part of Ser. No. 376,488, May 10, 1982, Pat. No. 4,440,187, which is a division of Ser. No. 142,392, Apr. 21, 1980, Pat. No. 4,343,322. This application Aug. 27, 1982, Ser. No. 412,440
Claims priority, application Australia, Sep. 2, 1981, PF0575
Int. Cl.³ A47C *7/62*
U.S. Cl. 135—109 **32 Claims**

1. A foldable shelter comprising a framework having two joints, a plurality of ribs each of generally U-shaped configuration, one of the free ends of each rib being connected at one of said joints and the other of the free ends of each rib being connected at the other of said joints, said joints permitting the ribs to be rotatable relative to one another and a flexible cover connected to the ribs, the joints including releasable mounting means for releasably attaching shelter to the framework of a lounge, said releasable mounting means comprising clamps which include springs which are pivotally mounted at respective said joints, and inwardly directed legs which co-operate with respective springs, said springs being biased towards the legs and extending inwardly, and generally in the directions of extent of the legs, from the locations at which they are mounted to the respective joints to terminal portions thereof adjacent the free ends of the legs, the ribs at end portions

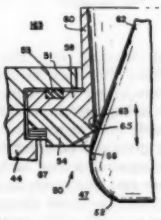
thereof adjacent the joints extending generally transversely to the directions of extent of the legs and springs, the terminal portions of said springs being spaced from said end portions of the ribs by a distance such that a user can separately open each said clamp by gripping with the fingers of one hand the ribs adjacent the respective clamp and manipulating with the thumb of the same hand the terminal portion of the spring of the clamp to move the terminal portion of the spring away from the co-operating leg, against resilient bias of the spring.

4,506,690

PRESSURE REGULATOR SYSTEM

John D. Mitchell, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 085,151, Oct. 15, 1979, Pat. No. 4,445,532. This application Sep. 27, 1982, Ser. No. 424,673
Int. Cl.³ F16K *25/00*
U.S. Cl. 137—1 **9 Claims**



7. A method of controlling fluid flow between a fluid inlet and a fluid outlet, comprising the steps of positioning along a fluid path a valve seat including a rigid valve seat base and a resilient elastomeric ring overlying the base; providing the base and ring with annular mutually parallel bearing surfaces and with tapered conical faces extending from the bearing surfaces radially inwardly and slightly out of angular alignment with each other; providing the termination of the tapered conical face of the seat with an angularly oriented bearing surface, and providing the termination of the tapered conical face of the ring with a radially inwardly projecting point overlying the angularly oriented bearing surface; deforming the ring to bring the parallel bearing surfaces and the tapered conical faces to the ring and base into mating engagement; providing a valve head having a conical cross section generally corresponding with the configuration of the angularly oriented bearing surface on the base; and arranging the valve head for

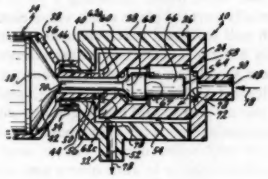
seating upon the point of the ring whereby the ring is folded over onto the angularly oriented bearing surface, between said valve head and said angularly oriented surface, when the valve head is seated.

4,506,691

THREE-WAY VALVE FOR AUTOMATIC SEQUENCING OF FLUID FLOW

Gus G. Tseo, San Diego, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 28, 1984, Ser. No. 594,135
Int. Cl.³ F16K *11/00*
U.S. Cl. 137—1 21 Claims



1. A device for sequencing pumped fluid flow from separate sources in an IV administration set comprising:

a housing formed with a fluid chamber and having a first inlet, a second inlet and an outlet;

a sleeve having a fluid passageway therethrough disposed in said fluid chamber for movement between a first position and a second position;

a check valve disposed in said passageway;

first means to urge said sleeve into the first position for fluid sealing engagement with said second inlet to define a fluid pathway in said chamber between said first inlet and said outlet;

second means to urge said sleeve from said first position into said second position for fluid sealing engagement with said first inlet to define a fluid pathway in said chamber between said second inlet and said outlet;

third means operative while said sleeve is in said second position to close said second inlet and open said check valve to define a fluid pathway through said passageway from said first inlet to said outlet.

21. A method for sequencing pumped fluid flow from separate sources in an IV administration set comprising the steps of:

a. engaging a first fluid source into fluid communication with a first inlet of a device comprising: a housing formed with a fluid chamber and having a first inlet, a second inlet and an outlet; a sleeve having a fluid passageway therethrough disposed in said fluid chamber for movement between a first position and a second position; a check valve disposed in said passageway; and first means to urge said sleeve into the first position for fluid sealing engagement with said second inlet to define a fluid pathway in said chamber between said first inlet and said outlet;

b. engaging a syringe with plunger into fluid communication with said second inlet to urge said sleeve from said first position into said second position for fluid sealing engagement with said first inlet to define a fluid pathway in said chamber between said second inlet and said outlet; and

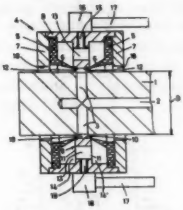
c. pumping fluid from said syringe until said plunger is in position to close said second inlet and open said check valve to define a fluid pathway through said passageway from said first inlet to said outlet.

4,506,692

DEVICE FOR FEEDING A PRESSURE MEDIUM INTO A SHAFT

Andy Schlegel, and Peter Busenhart, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sep. 13, 1982, Ser. No. 417,492
Claims priority, application Switzerland, Sep. 25, 1981, 6192/81
Int. Cl.³ F16L *27/08*
U.S. Cl. 137—102 7 Claims



1. A device for feeding a pressure medium into a rotatable shaft having at least one infeed channel, said device comprising

a housing having a pair of coaxially spaced chambers and a central wall coaxially between and separating said chambers; and

a pair of coaxially disposed seals mounted in said housing for positioning astride the infeed channel of the shaft, each seal having a resilient sealing lip disposed across a respective chamber and movable under the pressure of a pressure medium in said respective chamber from a rest position against said central wall and spaced from the shaft for sealing said respective chamber to a working position spaced from said wall and sealing engaging the shaft to expose said respective chamber to an exhaust of the pressure medium into the infeed channel of the shaft.

4,506,693

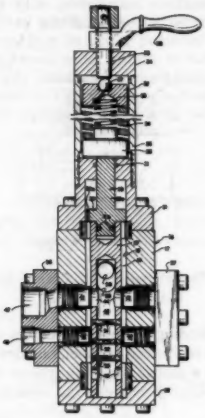
PRESSURE REGULATING VALVE

Richard C. Acker, Chagrin Falls, Ohio, assignor to Teledyne Industries, Inc., Cleveland, Ohio

Filed Sep. 27, 1982, Ser. No. 423,840
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—116.3 5 Claims

1. A valve comprising a body member defining a valve chamber, a valve member movable within said chamber, said valve member providing a planar valve surface with valve ports open through said valve surface, said body member providing passages therein aligned with said valve ports when said valve member is in predetermined positions, differential area sleeves in said passages engaging and sealing with said valve surface and operating to control fluid flow between said passages and associated ports in response to movement of said valve member, first seal means arranged to expose a first one of said sleeves to an associated external pressure higher than an associated internal pressure, second seal means arranged to expose a second one of said sleeves to an associated internal pressure higher than an associated external pressure, said first sleeve providing a radially extending surface, facing in a direction away from said valve surface and hydraulically unbalanced from the absence of an equal effective radially extending surface facing in a direction towards said valve surface, which is exposed to the associated higher external pressure and which produces a force of engagement between said first sleeve and said valve surface which is a direct function of the differential between external and internal pressures associated with said first sleeve, said second sleeve providing a radially extending surface, facing in a direction away from said valve surface and hydraulically unbalanced from the absence of an equal effec-

tive radially extending surface facing in a direction towards said valve surface, which is exposed to the associated higher internal pressure and which produces a force of engagement between said second sleeve and said valve surface which is a direct function of the differential between external and internal pressures associated with said second sleeve, said first and second sleeves and associated seal means being insertable into their respective passages from the ends thereof remote from



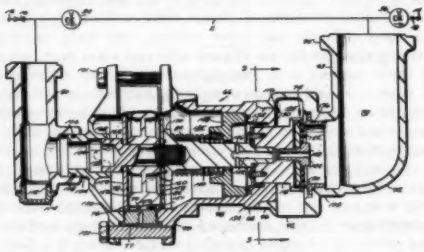
said valve surface, an adapter ring providing a seal retaining surface, said retaining surface locating said first seal means in sealing engagement with the exterior of said first sleeve, said adapter ring being insertable into said passage from the end thereof remote from said valve surface, said adapter ring providing a tubular portion extending between the wall of the associated passage and the outer surface of a portion of said first sleeve, the end of said tubular portion providing said retaining surface.

4,506,694

RELIEF VALVE ASSEMBLY FOR USE WITH BACKFLOW PREVENTERS

Joseph L. Daghe, Decatur, and Robert E. Sands, Shelbyville, both of Ill., assignors to Mueller Co., Decatur, Ill.

Filed May 28, 1982, Ser. No. 383,306
Int. Cl.³ F16K *24/00*
U.S. Cl. 137—218 **16 Claims**



1. A backflow preventer apparatus having an inlet adapted to be connected to a supply pipe and an outlet adapted to be connected to a service pipe, said backflow preventer apparatus comprising:

a body member having a flow passage therethrough from the inlet to the outlet;

a first upstream check valve and a second downstream check valve in series in said passage and defining a zone therebetween, said first check valve and said second check valve being operable to open position to permit flow of liquid from said supply pipe to said service pipe upon demand for liquid in said service pipe and closed to oppose reverse flow of liquid from said service pipe to said supply pipe; and

a relief valve assembly operable in response to changes in differential pressure between line pressure of said supply pipe and pressure in said zone, said relief valve assembly being mounted beneath said body member and including a housing having a passage therein with an opening in communication with said zone, said opening in the passage of the housing being totally below both said first check valve and said second check valve, said opening of the passage of the housing defining an inlet for discharge of liquid from said zone to the passage and an outlet for discharge of air from said passage to said zone, said passage having an outlet for liquid opening downwardly to atmosphere, valve means positioned in said passage above said liquid outlet, said valve means including a valve seat lying in a substantially vertical plane and a valve element cooperating with said seat, said valve element operating on a substantially horizontal axis, said passage downstream of said valve seat having an enlarged chamber surrounding said valve element and communicating with said liquid outlet, at least one air port in said housing above said liquid outlet and communicating with said chamber above a lower portion of said valve means, said at least one air port opening downwardly to atmosphere and permitting air to be drawn into an upper portion of said chamber and discharged through said passage and the opening of the same into said zone when said valve element is open and while liquid is flowing from the zone through said opening of said passage of the housing but not filling said passage and being discharged through said liquid outlet, rolling diaphragm means in said housing, means providing communication between the passage in said body member upstream of said first check valve and one side of said diaphragm means, means providing communication between the zone and the other side of said diaphragm means, means connecting said valve element to said diaphragm means for movement thereby, spring means normally urging said valve element toward open postion, said diaphragm means normally urging said valve element towards closed position when there is a predetermined pressure across said first check valve and toward open position in conjunction with said spring means when there is a pressure drop below said predetermined closing differential pressure across said first check valve.

4,506,695

PLASTIC TIRE VALVE

Harold A. Kuypers, Nashville, Tenn., assignor to Scovill Inc., Waterbury, Conn.

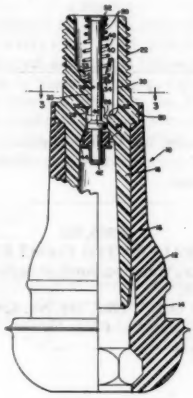
Filed Apr. 4, 1983, Ser. No. 481,724
Int. Cl.³ F16K *15/20*
U.S. Cl. 137—223 **2 Claims**

1. A tire valve for use on a tire comprising:

a molded rubber body having an opening therethrough;

a tubular rigid molded plastic insert bonded to the body in the opening, the insert having a tire end adjacent the tire and a remote end remote from the tire, the interior of the insert gradually narrowing from the tire end to a sharply narrowing conical seat intermediate the two ends, the seat surrounding a generally cylindrical inside surface defining a passage toward the remote end, from the remote end the interior having longitudinally disposed circumferentially arranged segments in two alternating groups, the segments of the first group each gradually narrowing from one radius at the remote end to an abrupt shelf inward to meet said generally cylindrical inside surface, the segments of the other group each narrowing from the one radius at the remote end at the same rate of incline as the

segments of the first group for some distance to a steep incline and then to an abrupt shoulder inward to a second radius spaced from the longitudinal axis of the insert, the segment then extending longitudinally in a straight run toward the tire end then outward in an abrupt ledge to meet the cylindrical inside surface, the outward ledges of the segments of the said other group being closer to the remote end than the inward shelves of the first group are to the remote end; and



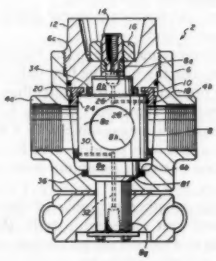
a valve means comprising a pin reciprocally disposed inside the straight runs of the segments of the other group and guided thereby, a spring surrounding the pin, and the pin having at its remote end an outward annular flange and the spring being compressed between the flange and the shoulder and being centered by the inclines, and a valve element at the end of the pin closer to the tire end and adapted to seat on the conical seat whereby the air flow through the valve when it is open is maximized and whereby the spring urges the valve closed.

4,506,696

GAS TIGHT PLUG VALVE

Heinz A. von Pechmann, 7903 Meadowvale, Houston, Tex. 77063

Filed Jun. 20, 1983, Ser. No. 506,034
Int. Cl.³ F16K 5/22
U.S. Cl. 137—246.11 **17 Claims**



1. A plug valve for use in controlling fluid flow, including the flow of gas, in a fluid transmission conduit comprising:

a body having a tapered bore transversely positionable in intersecting relationship to the fluid transmission conduit and having inlet and outlet ports alignable with the fluid transmission conduit;

a cylindrical plug rotatable about an axis perpendicular to the body ports and having a passageway extending therethrough perpendicular to the plug axis of rotation and being selectively alignable with the ports to permit fluid transmission therethrough;

at least one insert positioned with the insert axis parallel to the plug axis within the tapered body bore between the body and the plug and having a tapered exterior surface and a cylindrical inner bore with insert holes extending therethrough aligned with the body ports;

a nut engaging the body and the insert to hold the insert in alignment with the body; and

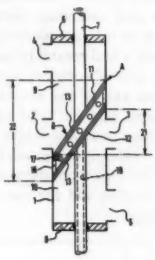
means for introducing lubricant through the plug and depositing lubricant within the cylindrical bore of the insert only between the plug and insert into separate continuous grooves in surrounding relationship to the plug passageway at each end of the plug passageway when the plug valve is in the open position.

4,506,697

FLOW CONTROL VALVE

George W. Marchant, Crawley, England, assignor to APV International Limited, Crawley, England

Filed Jan. 7, 1983, Ser. No. 456,210
Claims priority, application United Kingdom, Jan. 7, 1982, 8200436
Int. Cl.³ F16K 11/06
U.S. Cl. 137—312 **4 Claims**



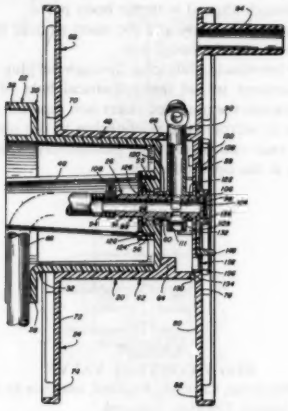
1. A flow control valve comprising a valve body including a cylindrical valve chamber having at least one pipe connection at an intermediate axial location for selective connection to at least one further pipe connection, a spindle extending axially of the valve chamber, an elliptical, flow-directing valve member mounted on the spindle, said valve member having duplex sealing surfaces in sealing engagement with the valve chamber around its circumference to define a leakage zone, said valve member being located obliquely on the spindle so as to extend across said intermediate axial location such that the valve member divides the valve chamber into two compartments and said at least one pipe connection communicates selectively with the two compartments depending on the angular position of the valve member, said at least one further pipe connection being connected to the compartments of the valve chamber to be selectively connected to said at least one pipe connection by operation of said valve member, and said leakage zone being vented to atmosphere, each of said duplex sealing surfaces being provided by a circumferential sealing member in the form of a lip seal and having a body thereof received in an undercut recess in the valve member.

4,506,698

GARDEN HOSE STORAGE APPARATUS

George L. Garcia, Chicago; Richard D. Recker, Palatine, and Thomas A. Tisbo, Barrington, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Jul. 7, 1983, Ser. No. 511,569
Int. Cl.³ B65H *75/34*
U.S. Cl. 137—355.26 25 Claims



1. A garden hose storage apparatus particularly adapted for mounting on a substantially vertical surface comprising; a side mount having a base adapted to be secured to a substantially vertical surface, and a hollow cantilever journal formed integral with the base and extending outwardly therefrom; an elongated pipe fixed in said cantilever journal and extending outwardly therefrom; a reel rotatably mounted on the journal, said reel having its axis of rotation substantially coincidental with the longitudinal axis of the elongated pipe; an out tube connected to the pipe, said out tube having a connector for connecting the out tube to a garden hose; and a lock releasably connecting the reel to the pipe to retain the reel on the journal; whereby release of the lock from the pipe allows the reel to be removed from the journal and the out tube released from its connection to the pipe.

4,506,699

FLAP FOR VENTILATION DUCTS

Rolf Tschudin-Mahrer, Lausen, Switzerland, assignor to Irbit Holding AG, Fribourg, Switzerland

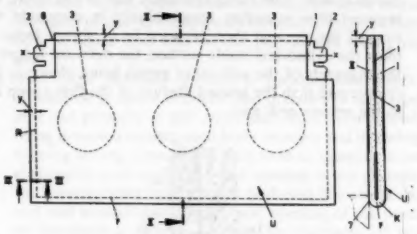
Filed Jan. 17, 1983, Ser. No. 458,395
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 8202047[U]
Int. Cl.³ F16K *15/03*
U.S. Cl. 137—375 4 Claims

1. A flap for a ventilation duct, particularly for automobile air-conditioning systems, comprising

a flap member having opposite wide surfaces with a predetermined number of openings therein, a longitudinal bottom edge, opposite side edges and an upper edge,

a pocket-shaped covering of foam material on the flap member, arranged in two layers which are folded around the longitudinal edge of the flap member onto said opposite wide surfaces, said foam material including foam material sections extending beyond the opposite side edges and the upper edge of the flap member, said layers having layer surfaces which face the wide surfaces of the flap member,

a bond-activated foil covering said layer surfaces, said foil connecting the foam material sections extending beyond the opposite side edges and the upper edge of the flap members,



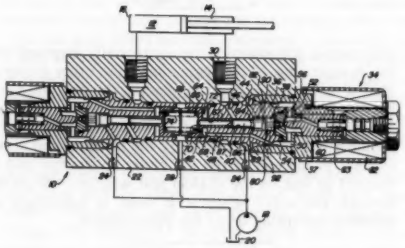
said bond-activated foil further connecting portions of the foam material lying opposite each other at the openings in the flap member.

4,506,700

POPPET VALVE WITH FLOAT FUNCTION

Kenneth D. Kramer, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 7, 1983, Ser. No. 539,785
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—596.16 10 Claims



1. A valve for controlling fluid communication between a pump, a reservoir and a double-acting fluid motor, the valve comprising:

a housing having a valve bore therein, a pump port communicating with the valve bore, a sump port communicating with the valve bore and first and second load ports communicating with the valve bore;

first and second pressure-responsive valve members movable in the valve bore;

a first poppet member movable in the valve bore and having a first seat engageable with the first valve member to form a first outlet poppet valve for controlling fluid communication between the sump port and the first load port and having a second seat engageable with a wall of the valve bore to form a first inlet poppet valve for controlling fluid communication between the pump port and the first load port;

a second poppet member movable in the valve bore and having a third seat engageable with the second valve member to form a second outlet poppet valve for controlling fluid communication between the sump port and the second load port and having a fourth seat engageable with a wall of the valve bore to form a second inlet poppet valve for controlling fluid communication between the pump port and the second load port; and

first and second pilot pressure generating means, each communicated with a respective one of the first and second valve members, and each for individually generating a pilot pressure signal which acts upon one of the valve

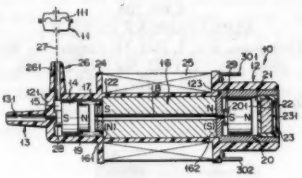
members to move both valve members and one of the poppet members to open the outlet poppet valve associated with the one valve member and to open the inlet poppet valve associated with the other valve member, and for together generating pilot pressure signals which act upon both valve members to move both valve members to open only both outlet poppet valves.

4,506,701

SOLENOID-OPERATED VALVE FOR SELECTING ONE OF TWO PRESSURE SOURCES

Kazuo Masaki, Kariya, and Ryohei Hiramatsu, Aichi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 11, 1983, Ser. No. 493,593
Claims priority, application Japan, May 12, 1982, 57-79498
Int. Cl.[3] F15B *13/044*
U.S. Cl. 137—596.17 **20 Claims**



1. A solenoid-operated valve for selecting one of two pressure sources, comprising:

a stationary core which is made of a magnetic material and which has first and second pole faces to be magnetized to first and second poles which are opposite to each other;

excitation coil means for exciting the stationary core to one of the first and second poles;

vent hole means for communicating between said first and second pole faces of said stationary core;

first and second permanent magnets which are respectively arranged to oppose said first and second pole faces of said stationary core, surfaces of which permanent magnets are magnetized to the opposite poles;

first and second magnet chambers which communicate with first and second pressure sources, respectively, and which house said first and second permanent magnets therein such that said first and second permanent magnets may be attracted to or repelled from said stationary core;

a first valve member which is formed integrally with said first permanent magnet and which closes a vent hole communicating with said first pressure source when repelled from said first pole face of said stationary core;

a second valve member which is formed integrally with said second permanent magnet and which closes said vent hole means of said stationary core when attracted to said second pole face of said stationary core; and

an output vent hole formed in said first magnet chamber.

4,506,702

ELECTROMECHANICAL IRRIGATION CONTROLLER

Leonard W. Doup, Riverside, Calif., assignor to The Toro Company, Riverside, Calif.

Filed Oct. 20, 1983, Ser. No. 543,953
Int. Cl.[3] A01G *27/00*
U.S. Cl. 137—624.2 **13 Claims**

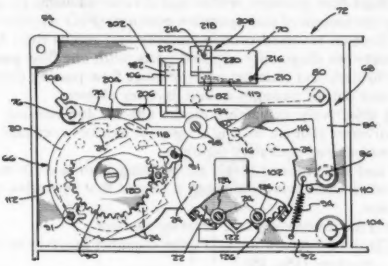
1. An electromechanical irrigation controller for use with a plurality of electrically activated valves for automatically regulating the time, location, and duration of irrigation comprising, in combination:

a switching means for sequentially activating said valves having adjustable timing unit means for determining dwell time on each valve;

an hour timer means for determining the time of day for activating said switching means;

a day timer means for determining the day for activating said switching means;

a single switching means activating switch:



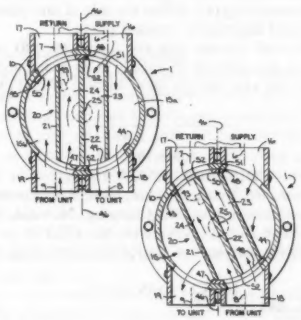
a lever means between said activating switch, said hour timer means, and said day timer means for combining an hour timer means time of day selection and a day timer means day selection to activate said activating switch.

4,506,703

FOUR-WAY FLUID FLOW DIVERTER VALVE

Walter J. Baron, Milwaukee, Wis., assignor to Water Services of America, Inc., Milwaukee, Wis.

Filed Mar. 14, 1983, Ser. No. 475,203
Int. Cl.[3] F16K *11/02, 11/07*
U.S. Cl. 137—625.43 **7 Claims**



1. In a diverter valve for connection between a source of pressurized fluid and a process device, with said valve having:

(a) an enclosed housing having a generally cylindrical wall (**10**) closed by ends walls (**11**, **13**) to form a cylindrical valve chamber (**15**),

(b) a pair of spaced adjacent upstream ports (**16**, **17**) and a pair of downstream ports (**18**, **19**) with each upstream port being in-line with said downstream port,

(c) an elongated longitudinal hollow tubular fluid flow diverter element (**20**) disposed within said housing and with said diverter element including a generally diametrical baffle (**22**) therewithin which forms a pair of separate parallel fluid flow passages (**23**, **24**), said diverter element and baffle being of a length approximating the diameter of said cylindrical wall and having end edges (**51**, **52**),

(d) diametrically opposed longitudinally extending opposed rib means (**35**, **36**) disposed on the outer surface of said diverter element and in-line and coextensive with said baffle,

(e) means (**26**, **27**) mounting said diverter element for rotation between two operative positions about a transverse

axis (25) coinciding with the center axis of said cylindrical wall,

(f) the first of said operative positions (FIG. 3) providing for two reversed generally parallel straight-through supply and return fluid flows between in-line upstream and downstream ports and through said chamber and said fluid flow passages within said diverter element,

(g) the second of said operative positions (FIG. 4) providing for two reversed crossing supply and return fluid flows between diagonally opposed ports, with one flow passing through said chamber and the other flow passing through said pair of passages in said diverter element,

(h) selectively actuatable means (30–34) for rotating said diverter element on said transverse axis between said first and second operative positions,

(i) and stop means (37–40) cooperating with said rib means when said diverter element is at said first operative position

(1) for positioning said diverter element

(2) and for separating said valve chamber into two isolated portions (15*a*, 15*b*),

(j) the improvement comprising cooperative means disposed (44, 45) on the interior of said cylindrical wall (10) and disposed on said end edges (51, 52) of said diverter element (20) for reducing of bypassing fluid flow within said valve, said cooperative means on the interior of said cylindrical wall comprising:

(1) seats (44, 45) mounted to said wall between said upstream and downstream ports and intersected by a central longitudinal plane (46) containing said baffle (22) when said element (20) is in its said first operative position,

(2) said seats extending in one direction circumferentially toward and surrounding a pair of diagonally opposed ports (18, 17) of said upstream and downstream ports, and extending in the other direction circumferentially and terminating (47, 48) on the side of said plane remote from said diagonally opposed ports,

(3) said seats having concave faces (49, 50) which, in section, are inclined planularly at an acute angle to said transverse axis and the inner surface of said cylindrical wall.

4,506,704

DISTRIBUTING VALVE

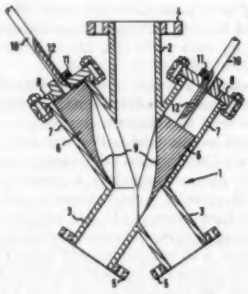
Johannes Boom, and Teunis Terlouw, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 27, 1982, Ser. No. 453,550

Claims priority, application United Kingdom, Dec. 30, 1981, 8139073

Int. Cl.³ F16K *11/20*

U.S. Cl. 137—883 **4 Claims**



1. A distributing valve comprising:

a valve body, said valve body having a cylindrical inlet and at least two cylindrical outlets, said outlets being arranged symmetrically with respect to the longitudinal axis of said inlet and extending in an opposite direction from said inlet;

at least two additional cylindrical members disposed on said valve body, one of said additional cylindrical members extending in opposite directions from each of said outlets and arranged coaxial with said outlets; and

at least two solid cylindrical closure members, said closure members being disposed in said additional cylindrical members for axial movement between a first position where they are retracted into said additional cylindrical members and a second position where they extend into said valve body and effectively close one of said outlets, the portion of said closure member that extends into the valve body being contoured to form a smooth guiding surface from said inlet to one of said outlets when said closure member is extended into said valve housing to close the other outlet.

4,506,705

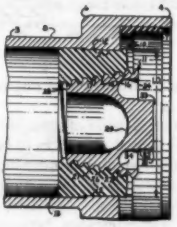
PIPE CLOSURE DEVICE

Ernest R. Thompson, Rte. 1, Box 73, Farlington, Kans. 66734

Filed Jan. 22, 1982, Ser. No. 341,800

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—89 **5 Claims**



1. A closure device for an opening in a pipe and the like, which comprises:

(a) a flexible, elastomeric sealing ring having:

(1) a peripheral surface;

(2) an inner end;

(3) an outer end;

(4) a bore extending therethrough and opening onto said sealing ring inner and outer ends and tapering inwardly from said outer end; and

(5) said bore having threading thereon;

(b) a rigid plug having:

(1) an inner end;

(2) an outer end;

(3) a peripheral surface having a generally frusto-conical configuration tapering from said plug outer end to said plug inner end;

(4) said plug peripheral surface having threading thereon; and

(5) a multi-sided boss extending outwardly from said plug outer end;

(c) said plug being threadably received and inwardly axially advanced in said sealing ring bore whereby said sealing ring is expanded and its peripheral surface engages said opening in sealing relation;

(d) said sealing ring limiting insertion of said plug into said sealing ring bore whereby said plug outer end is positioned outwardly from said seal outer end with said closure device in sealing relation in said opening;

(e) said threads on said sealing ring bore and said plug peripheral surface having respective lands and grooves with corresponding cross-sectional configurations with continuous, curvilinear, arcuate alternating convex and concave

configurations at said lands and grooves without flat areas between said lands and grooves;

(f) said cross-sectional configurations of said threads on said sealing ring bore and said plug peripheral surface having groove depths from tops of said lands to respective bottoms of said grooves and said threads having thread pitches comprising the respective spacings therebetween, said cross-sectional configurations of said threads being substantially represented by the formula:

$$d=P/2$$

wherein d represents the depths of said grooves and P represents the pitches of said threads;

(g) said sealing ring and plug threads extending substantially perpendicularly from said sealing ring bore and said plug peripheral surface respectively; and

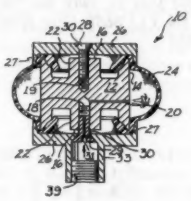
(h) said respective lands and grooves on said sealing ring threaded bore and said plug peripheral surface forming substantially continuous contact areas therebetween when said closure device is subjected to a pressure from within said pipe and the like whereby said sealing ring is deformed outwardly, said respective lands and grooves being adapted to shift relative to each other and maintain said continuous contact areas and a fluid seal therebetween.

4,506,706

EXPANSION BULB FOR PLUGGING A CONDUIT OR PASSAGE

Dennis E. Sandmann, 301 N. Hamilton Dr., Buchanan, Mich. 49107

Filed May 25, 1983, Ser. No. 498,057
Int. Cl.³ F16L *55/12*
U.S. Cl. 138—93 **5 Claims**



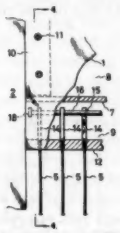
1. An expansion bulb for plugging a conduit or passage comprising a cylindrical rigid body having opposite ends, said body including a substantially concentric annular recess formed in each end of said body and a circular rib surrounding each recess, a continuous annular sleeve formed of expandable material circumscribing said body, said sleeve including integral inturned end portions surrounding said ribs and fitted continuously into said body recesses, and a rigid cap circumscribing said body at each rib, said cap overlying and pressing the adjacent inturned end of said sleeve to circumferentially compress and secure the sleeve end within each said recess, said body and a said cap including a bore in communication with a source of pressurized fluid, said bore extending through a said cap and said body to said sleeve from said source of pressurized fluid to cause expansion of said sleeve outwardly of said body.

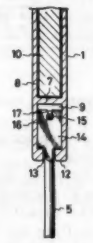
4,506,707

HEDDLE FRAME

Yoichi Shimizu, Izumishi, Japan, assignor to Kabushiki Kaisha Maruyama Seisakusho, Sakaishi, Japan

Filed Jul. 20, 1983, Ser. No. 515,455
Int. Cl.³ D03C *9/06*
U.S. Cl. 139—91 **8 Claims**





1. A heddle frame comprising:

(a) a pair of spaced side beams, each of which has a hollow guide channel in the interior thereof and a slit opening extending from said hollow guide channel to the interior face of said side beam, said slit opening being smaller in cross-sectional dimension than said hollow guide channel;

(b) a plurality of heddles disposed between said pair of spaced side beams, each of said heddles having:

(i) a head at each end which is received in the associated one of said hollow guide channels but which is sized and shaped such that it will not pass through said slit opening and

(ii) a hole which passes through each of said heads in the longitudinal direction of said hollow guide channel;

(c) a wire rod disposed in each of said hollow guide channels and passing through said holes in said heads of said heddles; and

(d) stoppers which are carried by each of said wire rods at each end thereof and which are sized and shaped so that they will not pass through said holes.

4,506,708

AIR PRESSURE FILLING SYSTEM FOR TIRES

Masashi Onuma, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 3, 1982, Ser. No. 446,611
Claims priority, application Japan, Dec. 4, 1981, 56-195791
Int. Cl.³ B65B *31/00*
U.S. Cl. 141—4 **2 Claims**

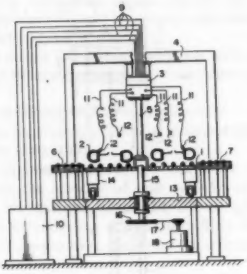
1. A method for inflawing tires in a moving line of tires to a predetermined pressure, the method comprising

delivering tires one by one at a work station to successive ones of a predetermined number of angularly spaced tire-receiving locations on a rotating table;

connecting a free end of a separate flexible air line to each tire as it is delivered to the rotating table;

connecting each air line through an individual stationary conduit via a rotary joint to a stationary source of air maintained at a pressure substantially greater than a desired final pressure in the tire for a single fixed time period, said time period being preselected to assure inflation of the tire to a pressure above said desired final pressure;

shutting the connection from the stationary conduit to the source of air at the end of said predetermined fixed time period;



opening a connection from the stationary conduit to the atmosphere;

sensing a pressure in the air line corresponding to the instantaneous pressure in the tire;

shutting the connection from the stationary conduit to the atmosphere in response to a sensed pressure in the air line equal to said desired final pressure;

disconnecting the air line from the tire as the tire on the rotating table reapproaches the work station; and

removing the properly inflated tire from the table.

4,506,709

CAPACITOR AND FILLING-LEVEL SIGNAL INDICATOR FOR FILLING ELEMENT OF CONTAINER-FILLING MACHINES FOR DISPENSING NON-CARBONATED OR CARBONATED LIQUIDS

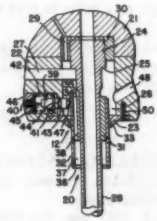
Werner Dennhardt, Bad Kreuznach, Fed. Rep. of Germany, assignor to Seitz Enginger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,254

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3216604

Int. Cl.³ B65B *3/26*

U.S. Cl. 141—95 **7 Claims**



1. A filling element, for container-filling machines, for dispensing carbonated or non-carbonated liquids; said filling element including a signal emitter which is responsive to said liquid at a predetermined filling height in a container which is to be filled; said signal emitter is in the form of a cylindrical capacitor, and is provided with an inner cylindrical electrode, and an outer cylindrical electrode, said filling element being intended for single and multi-chamber counter pressure filling machines, and including:

a filling element body in the form of a valve housing;

a filling tube which projects downwardly out of said valve housing into a pressed-on container which is to be filled, said filling tube having a liquid-conveying part and being provided with said signal emitter;

a pressurized gas chamber housing, of electrically insulating material, which is associated with said valve housing, is provided with a pressurized gas chamber, and is provided in the region of said signal emitter with an annular gap-like outlet which surrounds said filling tube;

an evaluation circuit;

a contact pin mounted in said pressurized gas chamber housing in such a way as to be longitudinally movable, said contact pin serving for electrical connection of said signal emitter with said evaluation circuit, and for holding said filling tube in said valve housing of said filling element; said liquid-conveying part of said filling tube being insulated relative to said valve housing, being formed as said inner cylindrical electrode of said cylindrical capacitor, and being in contact with said contact pin; said outer cylindrical electrode being disposed on the outer periphery of said inner cylindrical electrode; said outer cylindrical electrode having an upper end which extends into said pressurized gas chamber of said pressurized gas chamber housing, and a lower end which emerges from said pressurized gas chamber housing and extends below the level of liquid rising in said container which is to be filled to a predetermined filling height;

insulating means interposed between said inner cylindrical electrode and said outer cylindrical electrode;

a further contact pin disposed in said pressurized gas chamber housing in such a way as to be longitudinally movable; said further contact pin being in contact with said outer cylindrical electrode within said pressurized gas chamber;

an electrical lead, said further contact pin being connected with said evaluation circuit via said electrical lead.

4,506,710

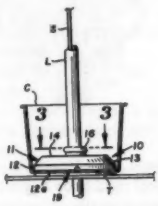
REVEL-ICE CREAM CONTAINER FILLING DEVICE

Thomas D. Sawvel, 10540 Ewing Ave. S., Bloomington, Minn. 55431

Filed May 23, 1983, Ser. No. 496,889

Int. Cl.³ B65B *3/04*; B65C *3/02*

U.S. Cl. 141—100 **14 Claims**



1. In combination with a container rotating device and an ice cream and syrup pumping mechanism, an ice cream and flavor dispensing head for filling containers to dispense the flavoring substance, adjacent the inner periphery of the container and centrally of the container for proper and appealing disbursement thereof, said head including:

a. a generally circular disc member of a diameter to be received in the container to be filled and extending substantially across the diameter thereof;

b. an ice cream dispensing aperture formed generally centrally of said disc:

c. means connecting said ice cream dispensing aperture to

the ice cream pumping mechanism for delivery of ice cream through said disc into the container;

d. syrup flow conduit means arranged within said connecting means to deliver flavoring syrup through said disc;

e. the lower surface of said disc being provided with at least one radially extending slot;

f. at least one syrup directing means receiving syrup from said syrup flow conduit and arranged within said slot of said disc and extending radially to have an open end thereof arranged adjacent the inner peripheral surface of the container, the outer peripheral surface of said syrup directing means being substantially co-planar with the lower surface of said disc.

4,506,711

CUTTING ROLLER

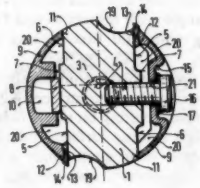
Gerhard Armbruster; Werner Neubert, and Günter Schaal, all of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,445

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246138

Int. Cl.³ B27G *13/00*

U.S. Cl. 144—230 **14 Claims**



1. A cutting roller, particularly for a hand-operated planing tool, comprising an elongated primary member having two side faces; a plurality of planing knives; two pressure members attached to said primary member at said side faces to hold the planing knives therebetween, said planing knives being adjustable on the periphery of the roller and securable thereon in position, said pressure members being formed with recesses; and fit members attached to the primary member at said side faces and received in the respective recesses of the pressure members so that the fit members are coupled to the respective pressure members, whereby the positions of the pressure members relative to the primary member and thus the positions of the planing knives relative to the primary member are fixed.

4,506,712

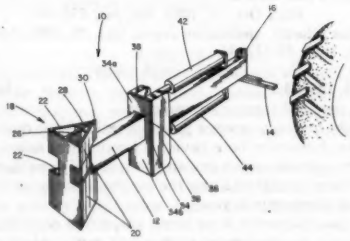
LOG SPLITTING APPARATUS

Bruce W. Johnson, Rte. 5, Box 204-I, Raleigh, N.C. 27604

Filed Oct. 11, 1983, Ser. No. 540,301

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **13 Claims**



1. A tractor mounted log splitting apparatus wherein said log splitting apparatus is adapted to be connected to a three-point hitch assembly of a tractor, said log splitting apparatus comprising: an elongated beam having opposed end; attaching means operatively associated with one end of said beam for connecting said beam to the three-point hitch of said tractor such that when connected said elongated beam extends from said tractor in cantilever fashion; a wedge assembly mounted to said beam and including a log engaging point for engaging the log during the log splitting operation; a log engaging pusher including a log engaging front face means movably mounted for fore-and-aft movement on said beam and normally in an inoperative mode assuming a first position spaced from said wedge assembly so as to define a log receiving area therebetween, said pusher including a log engaging face that faces said wedge assembly and the log engaging point thereof, said log engaging pusher further including an opening extending completely through said front face means and wherein said pusher is mounted on said elongated beam by extending said elongated beam through said opening; and hydraulic cylinder means anchored to said beam and operatively connected to said pusher for moving said pusher from said first position towards said wedge assembly such that a log held and disposed therebetween is split by the action of said pusher means driving said log into and through said wedge assembly, said hydraulic cylinder means further being operative to return said pusher back to said first position.

4,506,713

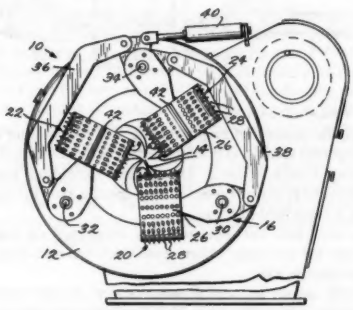
DEBARKING MACHINE WITH FEED ROLLS HAVING ELONGATED MEMBERS ACCOMMODATING LATERAL MOVEMENT

Walden M. Gaitten, deceased, late of Sylacauga, Ala. (by Dorothy A. Gaitten, executrix), assignor to Kockums Cancar, Corp., Talladega, Ala.

Filed Dec. 9, 1983, Ser. No. 559,817

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—208 E **7 Claims**



1. In a debarking machine of the type including an annular frame, a plurality of debarking tools, means mounting said tools in annularly spaced relation within said annular frame for rotation together about the axis of said annular frame and for movement toward and away from each other, infeed and outfeed mechanisms for feeding logs through said annular frame so that said tools will engage the exterior periphery of the successive logs and strip the bark therefrom during their movement through the annular frame, said infeed mechanism including three driven infeed spiked rolls arranged so that their spiked peripheries normally engage the exterior periphery of the log in centered relation and move the same axially through said annular frame for debarking by said tools, each of said spiked rolls including a cylinder and a multiplicity of spikes extending radially outwardly therefrom, the improvement which comprises:

at least one of said rolls including an elongated member secured to and extending substantially transversely across the exterior periphery of the cylinder thereof and defining a substantially continuous log penetrating surface disposed generally in the plane of the outer ends of said spikes, the log penetrating surface of said elongated member being configured to penetrate a log engaged thereby to an extent less than the penetration of the log by the spikes of the associated roll so that another roll cooperatively engaging the log serves to effect a transverse centering movement of the log along the elongated member while engaged thereby.

4,506,714

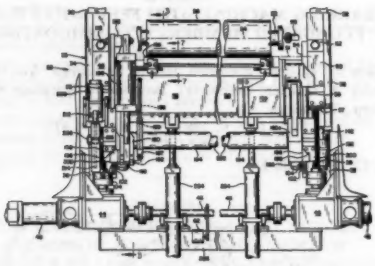
VENEER LATHE

Kenneth L. Shrum, Glide, and Edwin M. Heth, Portland, both of Oreg., assignors to Sun Studs, Inc., Roseburg, Oreg.

Filed Apr. 22, 1983, Ser. No. 487,512

Int. Cl.³ B27L *5/02*

U.S. Cl. 144—209 R **29 Claims**



1. A veneer lathe, comprising:

(a) spindle means, defining a spindle axis, for rotating a block about said spindle axis while veneer is cut from said block;

(b) way means, located fixedly and extending generally transversely with respect to said spindle axis, for supporting a main feed carriage;

(c) a main feed carriage movably supported on said way means for movement transversely toward and away from said spindle axis;

(d) knife carrier support means, located on said main feed carriage and defining a knife pitch angle axis, for movably supporting a knife carrier therein;

(e) an elongate knife carrier extending longitudinally parallel with said pitch angle axis, said knife carrier being rotatably supported in said knife carrier support means for rotation about said pitch angle axis so as to provide different degrees of knife pitch angle;

(f) pitch angle adjustment means located on said main feed carriage for rotating said knife carrier support means about said pitch angle axis to alter the degree of said knife pitch angle;

(g) pitch angle sensor means located on said main feed carrage for sensing movement of said knife carrer relative to said knife carrier support means for determining the degree of said knife pitch angle; and

(h) pitch angle indicator means remote from said pitch angle sensor means and responsive therto for indicating the degree of said knife pitch angle.

4,506,715

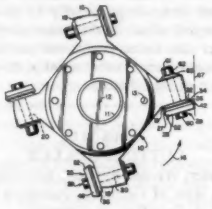
ADZING BIT ASSEMBLY

George T. Blackwell, P.O. Box 278, Oneonta, Ala. 35121

Filed May 11, 1983, Ser. No. 493,606

Int. Cl.³ B22G *13/00*

U.S. Cl. 144—241 **12 Claims**



7. An adzing bit assembly for use with an adzing apparatus to cut railroad crossties and the like comprising

a substantially disk-shaped cutting bit including parallel first and second bearing surfaces with the first bearing surface of said cutting bit being of larger diameter than its second bearing surface, and a conical peripheral surface disposed at an acute angle with respect to said first bearing surface and forming with said first bearing surface a circular cutting edge,

a substantially disk-shaped cutting bit shield including parallel first and second bearing surfaces with the second bearing surface of said cutting bit shield being of larger diameter than its first bearing surface, and a conical peripheral surface disposed at an acute angle with respect to said second bearing surface, and forming with the second bearing surface a circular wear edge, the second bearing surface of said cutting bit shield being of a diameter substantially equal to the diameter of the first bearing surface of said cutting bit so that the cutting edge of said cutting bit and the wear edge of the cutting bit shield are substantially equal in diameter,

connector means for holding said cutting bit and said cutting bit shield in coaxial relationship with the second bearing surface of said cutting bit shield facing the first bearing surface of said cutting bit,

said cutting bit being fabricated of harder material than said cutting bit shield,

whereby when the adzing bit assembly is mounted on an adzing apparatus with the cutting edge facing in the direction of movement and used to cut railroad crossties or the like, the wear edge of the cutting bit shield wears away to expose the cutting edge of the cutting bit.

4,506,716

PENCIL SHARPENER

Hirro Hayashi, Fussa, Japan, assignor to Yumi Tsukuni, Tokyo, Japan, a part interest

Filed Oct. 25, 1982, Ser. No. 436,420

Claims priority, application Japan, Oct. 29, 1981, 56-172129; Jul. 31, 1982, 57-132956

Int. Cl.³ B43L *23/00*

U.S. Cl. 145—3.5 **20 Claims**

1. A pencil sharpener comprising:

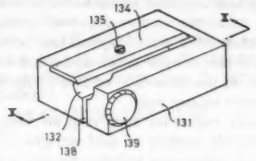
a body having a tapered pencil-insertion bore therein, said pencil-insertion bore having a longitudinal axis;

a cutting blade means mounted to said body and disposed to form a cutting slit along the longitudinal direction of said pencil-insertion bore;

said pencil-insertion bore being adapted to receive a pencil therein for sharpening against said cutting blade means;

means forming an adjustable width regulating slit in said body along said pencil-insertion bore and spaced from said

cutting slit in the circumferential direction of said pencil-insertion bore; and



means coupled to said body for adjusting the width of said adjustable regulating slit to thereby adjust the taper of said pencil-insertion bore.

4,506,717

WOVEN WIRE FABRIC AND A TIRE HAVING A TREAD REINFORCING PLY MADE THEREOF

Marie-Rita Thise-Fourgon, Bras, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 28, 1983, Ser. No. 479,763

Int. Cl.³ B60C *9/20*

U.S. Cl. 152—358 **8 Claims**

1. A tire comprising at least one belt ply or breaker ply of woven wire fabric which comprises:

(a) a plurality of metallic warp cords, each of said metallic warp cords being oriented substantially parallel to, and equidistant from, adjacent metallic warp cords; and

(b) a plurality of weft cords, said weft cords being interwoven with, and oriented substantially transverse to said metallic warp cords, each of said weft cords comprising a single strand of glass filaments encapsulated in a resorcinol-formaldehyde-latex adhesive.

4,506,718

PNEUMATIC TIRES FOR OFF-ROAD VEHICLES

Masaru Abe, Sayama; Isao Miyoshi, Kodaira; Toshiro Tezuka, Higashi-Murayama, and Toshio Yoshimoto, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 645,190, Dec. 29, 1975, abandoned. This application Apr. 7, 1980, Ser. No. 137,694

Claims priority, application Japan, Dec. 28, 1974, 50-3823; Jun. 6, 1975, 50-67526

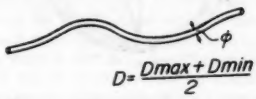
Int. Cl.³ B60C *9/20, 9/10*

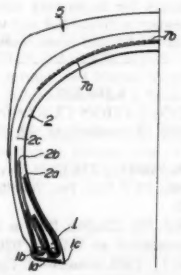
U.S. Cl. 152—361 R **6 Claims**

1. A pneumatic off-road tire having improved cut resistant properties for use on vehicles running over unimproved surfaces, comprising:

a carcass body composed of a plurality of rubberized ply layers superimposed one upon the other and each containing nylon cords embedded therein, the cords of approximately one-half of the carcass ply layers extending in an opposite direction to the cords associated with the remaining carcass ply layers to define a bias construction, and

a breaker superimposed about said carcass body and composed of at least one rubberized layer each containing extensible reinforcing elements embedded therein, said extensible reinforcing elements comprising a filament bundle formed by assembling 3 to 30 helically formed steel





filaments together without twisting and each having an average diameter D projected on a plane perpendicular to the axial line of a helix delineated by one pitch of said helically formed filament having a diameter ϕ in the range of 0.13 to 0.5 mm and, $D \geqq 3\phi$, said reinforcing elements being formed of material having a tensile strength of at least 140 Kg/mm^2 and having an elongation at breaking strength which is 0.25 to 1.4 times that of the nylon cord of said carcass body, said reinforcing element being inclined 30° to 55° with respect to the equatorial line of the tire, said breaker layer as a whole being extensible to prevent cut failure of the tire when running over unimproved surfaces.

4,506,719

SEALING DEVICE FOR FACILITATING PRESSURING OF TUBELESS TIRE

Dolphard Gaither, Rte. 1, Box 43, Cameron, Okla. 74932

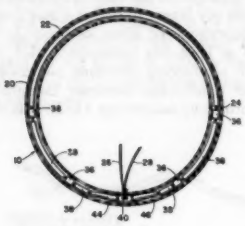
Filed Sep. 29, 1982, Ser. No. 427,952

Int. Cl.³ B60C *25/00*

U.S. Cl. 157—1.1 **3 Claims**

1. A sealing device for facilitating pressuring of a tubeless tire and adapted to be positioned in the hiatus between the deflated tire and the associated wheel, the sealing device comprising hollow endless tube means, cable means extending through said hollow endless tube means and having the opposite ends thereof extending outwardly from said tube means through port means provided in the sidewall of the tube means, and adjustment clamp means engageable with the opposite ends of said cable means for adjusting the overall length of the cable for facilitating retaining of the sealing device in position with respect to the tire and wheel during the tire pressuring operation without manual assistance and for facilitating automatic release of the sealing device from the engagement with

the tire and wheel upon pressure of the tire to a preselected internal pressure level, and including inner tubular means disposed within said endless tube means and receiving the cable means therethrough, and wherein the inner tubular means comprises a first tubular member extending throughout substantially one-half the circumference of the endless tube



means, a plurality of relatively short tubular members disposed on said cable means in spaced relation with respect to the first tubular member and each other, and including roller means disposed on said cable means and interposed between said inner tubular members for facilitating release of the sealing device from engagement with the tire and wheel upon internal pressurization of the tire to said preselected level.

4,506,720

INSULATION CURTAIN

Andrzej T. Iwanicki, Östrandsvägen 72, S-122 43 Enskede, Sweden

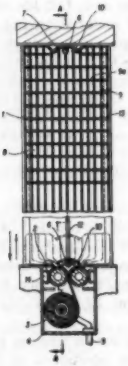
PCT No. PCT/SE80/00087, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/02036, PCT Pub. Date Oct. 2, 1980

Continuation of Ser. No. 224,566, filed as PCT SE 80/00087, Mar. 26, 1980, published as WO 80/02036, Oct. 2, 1980, § 102(e) Date Nov. 17, 1980, abandoned. This PCT application Mar. 26, 1980, Ser. No. 579,802

Claims priority, application Sweden, Mar. 26, 1979, 7902682

Int. Cl.[3] **E06B** *9/08, 7/21*

U.S. Cl. 160—26 **12 Claims**



1. An insulating curtain assembly comprising:

(a) a flexible curtain element including an airtight central inflatable chamber and at least one airtight peripheral inflatable chamber, said airtight peripheral inflatable chamber being arranged so that, on being inflated, it expands against sealing surfaces, thereby substantially preventing air circulation to a predetermined area to be insulated by said curtain element;

(b) storage means for storage of said curtain element in a contracted state and from which said curtain element can be fed out to extend over the predetermined area;

(c) compression means adapted to effect generally linear airtight compression of said curtain element to subdivide, in airtight fashion, said airtight central inflatable chamber into an inflatable section disposed on that side of said curtain element which is beyond said compression means relative to said storage means and a non-inflatable section disposed on the same side of said compression means as said storage means; and

(d) air supply means for supplying air sequentially first to said inflatable section of said airtight central inflatable chamber to thus cause inflation thereof and to generate a force at said compression means effective to feed out said curtain element and then to said at least one airtight peripheral inflatable chamber when said inflatable section of said airtight central inflatable chamber has reached its fed out position.

4,506,721

METHOD FOR PRODUCTION OF FIBER-REINFORCED COMPOSITE MATERIAL

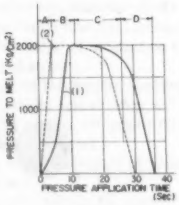
Keisuke Ban, Fujimi; Takeo Arai, Tokyo; Tatsuo Sakakibara, and Noriaki Miyake, both of Ueda, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 914,297, Jun. 9, 1978, abandoned, which is a continuation of Ser. No. 725,990, Sep. 23, 1976, abandoned. This application Apr. 18, 1983, Ser. No. 470,630

Claims priority, application Japan, Sep. 30, 1975, 50-118690

Int. Cl.[3] **B22D** *19/14, 18/02*

U.S. Cl. 164—97 **5 Claims**



1. A method of producing fiber reinforced composite material by application of high pressure which comprises: the steps of preforming an inorganic fiber material into a shaped body of an arbitrary configuration with a bulk density of 0.6 g/cm^3 or less; causing a matrix consisting of metals or alloys thereof in molten state to penetrate into the shaped body by continuously applying pressure to the melt penetrating into the shaped body; said pressure being applied in stages wherein: in a first filling stage the pressure applied to the melt is maintained at a low positive value so that the melt is maintained in molten state and, prior to partial solidification of the melt taking place, the melt fully fills the fiber-shaped body of relatively low bulk density without the body exerting any substantial resistance to penetration of the melt, in a second pressure application stage, the pressure is increased rapidly and the melt begins to solidify, in a third squeeze solidification stage the pressure is initially maintained at a substantially constant value and thereafter is decreased and during this third stage, the melt squeeze-solidifies under high pressure and is integrally combined with the fiber-shaped body, and in a fourth solidification stage, the pressure is rapidly reduced in a short period of time so as to allow complete solidification of the melt.

4,506,722
METHOD OF AND APPARATUS FOR CASTING SPHERICAL METAL LUMPS

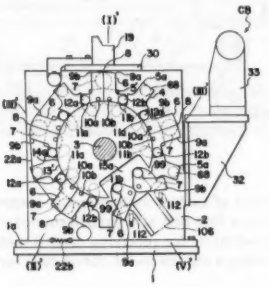
Terumoto Yamaguchi, Anjo, and Tsuneo Terajima, Nagoya, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Continuation of Ser. No. 155,091, Jun. 2, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,068

Claims priority, application Japan, Jun. 7, 1979, 54-71545; May 19, 1980, 55-66277

Int. Cl.[3] **B22D** *5/02, 13/04*

U.S. Cl. 164—130 **11 Claims**



1. A casting apparatus for casting spherical metal lumps which comprises: a support frame; an upright rotary member rotatably supported on said support frame; said rotary member being rotatable past an odd number of at least five stopping positions spaced at equal intervals around the circumference of said rotary member and including an upper stopping position at the top of said rotary member and a lower stopping position at the bottom of said rotary member and spaced in the direction of rotation from said upper stopping position by an odd plurality of stopping positions; a plurality of casting mold means, one for each stopping position, extending radially outwardly from said rotary member and each including a pair of mold portions divided in a radial direction and defining at least one spherical cavity therein and a corresponding short pouring gate extending outwardly from and communicated with said spherical cavity, said pair of mold portions being pivotally connected at base portions thereof to said rotary member for being opened and closed by pivoting about said pivotal connections; means for successively closing said pair of mold portions at said upper stopping position and means for successively opening said mold portions at said lower stopping position; funnel means at said upper stopping position and positioned for communicating with the short pouring gates upon arrival of said mold portions at said upper stopping position during the intermittent rotation of said rotary member for pouring the molten metal into said spherical cavities, drive means comprising means for moving said rotary member in an uninterrupted movement through an angle equal to an even integral multiple of the angle between adjacent stopping positions at each portion of the intermittent rotation, said multiple being at least two; and means extending along part of the path of said short pouring gates immediately after said upper stopping position during intermittent rotation of said rotary member for closing said short pouring gates during intermittent movement of the rotary member.

9. A method of operating a casting apparatus for casting spherical metal lumps, which apparatus has a support frame, an upright rotary member rotatably supported on said support frame, said rotary member having an odd number of at least five stopping positions spaced at equal intervals around the circumference of said rotary member and including an upper stopping position at the top of said rotary member and a lower stopping position at the bottom of said rotary member and spaced in the direction of rotation from said upper stopping position by an odd plurality of stopping positions; a plurality of casting mold means, one for each stopping position, extending radially outwardly from said rotary member and each including a pair of mold portions divided in a radial direction and defining at least one spherical cavity therein and a corresponding short pouring gate extending outwardly from and communicated with said spherical cavity, said pair of mold portions being pivotally connected at base portions thereof to said rotary member for being opened and closed by pivoting about said pivotal connections; said method comprising intermittently moving said rotary member, each movement being an uninterrupted movement through an angle equal to an even integral multiple of the angle between adjacent stopping positions, said multiple being at least two for moving said pairs of mold portions to successive stopping positions, and each time an empty pair of mold portions stops at said upper stopping position, filling the thus stopped mold portions with molten metal, and each time a pair of mold portions with a cast metal lump therein stops at the lower stopping position, opening the thus stopped pair of mold portions for discharging the cast metal lump, whereby a filled pair of mold members will always make more than one complete rotation before arriving at said lower stopping position.

4,506,723
TUBULAR DIE FOR THE CONTINUOUS CASTING OF A THIN-WALLED TUBE

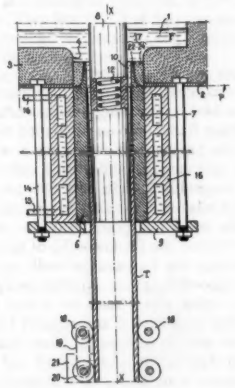
Rio Bellocci; Yves Gourmel, and Michel Pierrel, all of Pont-á-Mousson, France, assignors to Pont a Mousson S.A., Nancy, France

Filed Feb. 22, 1983, Ser. No. 468,739

Claims priority, application France, Mar. 12, 1982, 82 04195

Int. Cl.[3] **B22D** *11/00, 11/04*

U.S. Cl. 164—421 **12 Claims**



1. A tubular die arrangement for a continuous tube casting installation, comprising: a pouring basin (**1**) for molten metal provided with a lower outlet orifice (**4**), a tubular die (**6**) mounted to the basin and depending downwardly from the outlet orifice, a cooling jacket (**15**) mounted below the basin along an extension of an inner wall of the orifice, and a heated core (**8**) which together with the die defines a narrow tubular casting space (**10**) coaxial with respect to the orifice, the die comprising a thick cylindrical body (**7**) surrounded by the cooling jacket, and an integral head portion (**17**) projecting upwardly into the orifice, said head portion being composite and comprising:

(a) at least one narrow annular inner lip (**22,32,42,46**) of relatively high thermal conductivity material having an inner surface (**26**) forming a continuous extension of an inner surface (**26**) of the die body, said lip being joined to

the die body at a plane of contact (P) between the basin and the cooling jacket, and

(b) at least one insulating ring (24,34,45,48,49) of relatively low thermal conductivity material surrounding the lip and in direct contact with the body, said composite head portion constituting a relatively high resistance heat transfer path from the basin to the cooling jacket, whereby said lip is maintained at a relatively high temperature to thereby prevent premature molten metal solidification and obstruction of an entrance portion of said casting space.

4,506,724

INGOT MOLD WITH ADJUSTABLE DIMENSIONS FOR A CONTINUOUS CASTING MACHINE

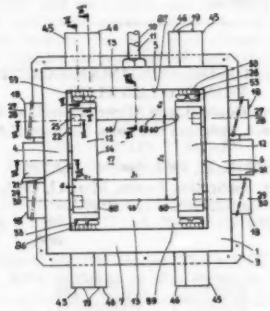
Raymond Vial, Lorette, France, assignor to Cledid S.A., Saint-Chamond, France

Filed Mar. 13, 1981, Ser. No. 243,295

Claims priority, application France, Mar. 19, 1980, 80 06126

Int. Cl.³ B22D *11/04, 11/16*

U.S. Cl. 164—436 **9 Claims**



1. In an ingot mold with adjustable dimensions for a continuous casting machine, comprising a support frame, means for fixing said support frame onto an oscillation table, a rectangular casting cavity having a thickness and a width inside said support frame, said casting cavity being defined by the inner faces of two longitudinal walls and two parallel transverse walls in opposed relation at the sides of said support frame, said transverse walls being interposed between said longitudinal walls and determining the thickness (l_1) of said casting cavity; means for applying said longitudinal walls against said transverse walls, supported against corresponding sides of said support frame, removable means for fixing said transverse walls on the other two sides of said support frame, and means for adjusting the spacing of opposed inner faces of said transverse walls and thereby the width (l_2) of said casting cavity, each said transverse wall having an individual cooling circuit and removable means for sealed coupling to a cooling fluid supply circuit and to a discharge circuit in said support frame, the improvement wherein

(a) said means for fixing said transverse walls are constituted by actuators for applying each said transverse wall against an interior face of the corresponding side of said support frame, each said transverse wall extending over a thickness equal to the distance between said interior face of said support frame and the inner face of said casting cavity;

(b) removable means are provided for coupling with corresponding coupling members urged outward from said support frame by said actuators so as to fix a said transverse wall, and inward so as to free said transverse wall; and

(c) said means for adjusting the spacing of said opposed inner faces of said transverse walls are constituted by at least one element for adjusting the thickness of at least one of said transverse walls.

4,506,725

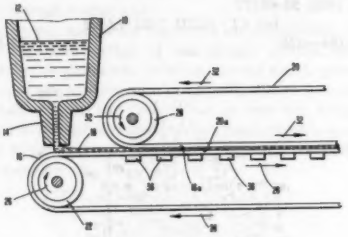
METHOD AND APPARATUS FOR MAGNETICALLY HOLDING A CAST METAL RIBBON AGAINST A BELT

John R. Bedell, Madison, N.J., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Nov. 5, 1982, Ser. No. 439,630

Int. Cl.³ B22D *11/06, 27/02*

U.S. Cl. 164—463 **14 Claims**



1. A method of casting molten metal, comprising:

(a) moving a first belt at a predetermined speed to form a chilled substrate for receiving molten metal deposits;

(b) depositing a molten metal ribbon on a surface of the first belt;

(c) moving a second belt adjacent the first belt at substantially the same speed as the first belt in substantially parallel relationship thereto; and

(d) magnetically urging at least one of said belts toward the other and bringing the surface of the second belt into squeezing relationship with the corresponding surface of the first belt to sandwich the ribbon between the belts while moving at the predetermined speed.

6. In an assembly for casting continuous metal ribbon, an apparatus for controllably cooling the ribbon, comprising:

(a) a continuously moving chilled belt traveling at a predetermined speed, including a working surface forming a substrate for receiving molten metal;

(b) means for depositing a molten metal ribbon onto the working surface of the chilled belt;

(c) a hugger belt disposed adjacent the working surface of the chilled belt, said hugger belt including a working surface traveling in substantially parallel relationship to said working surface of said chilled belt at said predetermined speed; and

(d) means for magnetically urging the working surfaces of the chilled and hugger belts into squeezing relationship with each other and sandwiching the ribbon therebetween to control the ribbon and enhance the heat transfer relationship between the ribbon and the belts.

4,506,726

REGENERATOR FLOW DISTRIBUTION BY MEANS OF UPSTREAM AND DOWNSTREAM AIR JETS

Yih-Wan Tsai, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 305,242, Sep. 24, 1981,. This application Feb. 28, 1983, Ser. No. 470,700

The portion of the term of this patent subsequent to Mar., 2000, has been disclaimed.

Int. Cl.³ F28D *17/00*

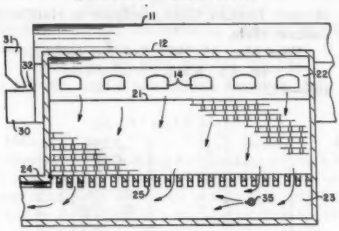
U.S. Cl. 165—1 **16 Claims**

1. A method of controlling gas flow through a regenerator comprising:

flowing gas from an upstream side to a downstream side of a bed of refractory material,

distributing the gas flow into the upstream side of the bed through a distributing chamber at the upstream side of the bed, the gas flow through the distributing chamber includ-

ing a flow portion transverse to the flow through the bed; and



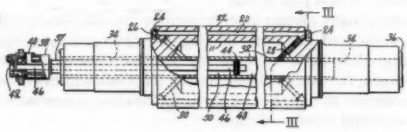
injecting a jet of gas into the distributing chamber countercurrent to the transverse flow in the distributing chamber so as to alter the distribution of gas flowing through the bed.

4,506,727

CONVERTED TEMPERATURE CONTROL ROLL

Archie N. Swasey, Oxford, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Jun. 14, 1982, Ser. No. 388,418
Int. Cl.³ F28D *11/02*
U.S. Cl. 165—90 **1 Claim**



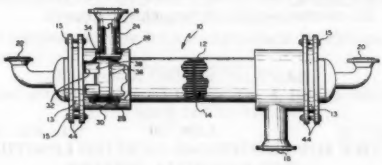
1. A roll having a solid portion providing a cylindrical work surface and having a central enlarged coaxial core, and having coaxial journal portions extending from opposite ends of the solid cored portion, said roll being converted to provide temperature control means including spaced passages extending lengthwise from end to end through the solid portion in a coaxial circular pattern between the working surface and the core, pipes each extending from one end of a particular passage inwardly into the core, a tube supported in the journal portions and extending coaxially through the core and having a baffle isolating opposite ends of the tube into an inlet end and a discharge end, the pipes each connecting one end of each particular passage through the core to one end of the tube, an annular cap at each end of the working surface solid portion of the roll covering the ends of the passages, the caps each having grooves connecting pairs of adjacent passages, the arrangement being adapted to conduct fluid from the inlet end of the tube through the pipes to one end of certain passages, through the certain passages to the opposite end of the roll, through the grooves in the cap at the opposite end of the roll to adjacent passages to the one end of the roll and through grooves in the cap at said one end to the next adjacent passages to the opposite end of the roll and thence through the pipes to the discharge end of the tube.

4,506,728

APPARATUS FOR VARYING SHELL FLUID FLOW IN SHELL AND TUBE HEAT EXCHANGER

Cecil C. Gentry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 6, 1982, Ser. No. 395,450
Int. Cl.³ F28F *27/00*
U.S. Cl. 165—96 **18 Claims**



1. A shell unit for use in a shell-and-tube heat exchanger, comprising:

a shell having at least one shell port;

at least one annular distributor attached to said shell, said annular distributor having an annulus which surrounds said shell such that fluid communication is provided between said shell port and said annulus;

at least one nozzle means in communication with the annulus of said annular distributor;

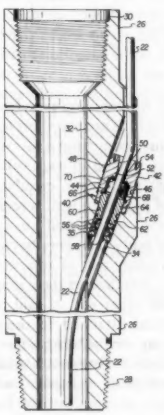
means for adjusting the fluid flow area of said at least one shell port.

4,506,729

DRILL STRING SUB WITH SELF CLOSING CABLE PORT VALVE

Albert P. Davis, Jr., Houston; Orien M. Knight, Joshua, and John W. Stoltz, Fort Worth, all of Tex., assignors to Exxon Production Research Co., Houston and Gearhart Industries, Inc., Fort Worth, both of, Tex.

Filed Feb. 22, 1983, Ser. No. 468,534
Int. Cl.³ E21B *17/00, 34/00*
U.S. Cl. 166—65 M **20 Claims**



1. A drill string sub adapted to be interposed in a drill string, comprising:

an elongated tubular member having a side wall and including a central longitudinal bore forming a passage through said sub;

a port formed in said side wall for running a flexible cable from the exterior of said sub through said port into said passage;

a housing having a channel therethrough for receiving said cable, said housing being adapted to be attached to said tubular member at said port in a manner so that said cable may be inserted through said channel into said passage; and

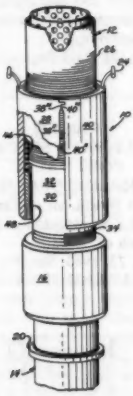
a valve assembly attached to the housing and capable of automatically and substantially closing said channel when said cable is removed therefrom, thereby substantially preventing fluid communication between said passage and the exterior of said sub through said channel.

4,506,730

DEVICE FOR ASSEMBLING JACKETED LENGTHS OF PIPE BASE WELL SCREENS

Chris D. McCollin, Shoreview; Richard E. Allred, Chisago City; Leslie K. Bearl, Anoka, and David C. Card, New Brighton, all of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed Mar. 2, 1984, Ser. No. 585,677
Int. Cl.³ E21B *41/00*
U.S. Cl. 166—85 **5 Claims**



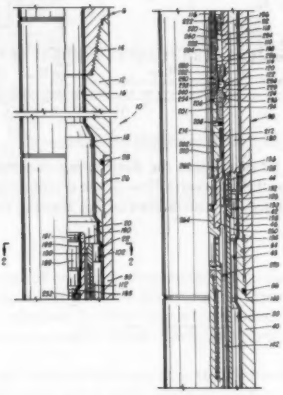
1. Apparatus for assemblying pipe base well screens having blank end sections which are too short to be engaged by power tongs, said apparatus comprising a pair of semicylindrical body members which are hinged to each other at one pair of adjacent edges so that said body members may be assembled around a section of pipe base well screen in overlying relation to both a blank end section and an axially adjacent screen jacket section, said body members having cooperating fastening means on their other pair of adjacent edges and an elastomeric liner portion attached to their inner surfaces at one end portion thereof, the other end of said body members having serrated jaw portions attached to their inner surfaces, said cooperating fastening means being adapted to draw said other pair of adjacent edges towards each other to reduce the internal diameter of said body members and compress and force said elastomeric liner portions into friction engagement with a section of screen jacket which they overlie, said other pair of adjacent edges being spaced from each other at least in the region overlying said other end of said body members and a portion of said screen jacket so that an external wrench or tong force applied to the outer surface of said body members in said region will cause a decrease in the internal diameter of said body members and engagement of said serrated jaw portions with said blank end section but will not deform said screen jacket portion.

4,506,731

APPARATUS FOR PLACEMENT AND RETRIEVAL OF DOWNHOLE GAUGES

Neal G. Skinner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Mar. 31, 1983, Ser. No. 480,980
Int. Cl.³ E21B *23/02, 47/06*
U.S. Cl. 166—113 **1 Claim**



1. A gauge depositing means for use in a pipe string disposed in a well bore below a valve included in and having a lesser bore diameter than said pipe string, comprising:

a gauge receptacle incorporated in said pipe string below said valve, said gauge receptacle including:

a substantially tubular outer housing having thread means at its top and bottom adapted to mate with thread means of said pipe string whereby said gauge receptacle is incorporated in said pipe string;

a substantially tubular inner housing within and substantially coaxial with said outer housing, and inner and outer housings defining a substantially annular channel therebetween, the inner housing having an upper and lower end whereby the interior of the inner housing communicates with said annular channel;

a plurality of support means having substantially radially extending legs separated by longitudinally extending apertures, disposed between and secured to both said inner housing and said outer housing, said outer housing, inner housing and support means comprising an integral structure;

landing means associated with the interior of said inner housing, said landing means comprising at least one substantially annular groove in the bore of said inner housing; and

locking mandrel means adapted to carry said gauge, said locking mandrel means including locking dogs configured to detachably mate with said at least one annular groove and fishing neck means adapted to be selectively engaged and disengaged by a running tool, said locking mandrel means having associated therewith:

gauge housing means having a generally tubular configuration and at least one means for communicating from the exterior to the interior thereof, whereby well fluid can act upon a gauge contained by said gauge housing means; and

double-acting shock absorber means disposed between and secured to both said locking mandrel means and said gauge housing means;

said running tool, said locking mandrel means, said gauge housing means and said shock-absorber means sized to travel through the bore of said valve.

4,506,732

METHOD FOR INCREASING THE BONDING STRENGTH BETWEEN GRAINS IN A SUBSURFACE FORMATION ZONE

Simon Zwolle, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1984, Ser. No. 602,046

Claims priority, application United Kingdom, Jul. 7, 1983, 8318386

Int. Cl.[3] E21B *33/138*

U.S. Cl. 166—292 4 Claims

1. In a method for increasing the bonding strength between grains in a subsurface formation zone with water-wet pore walls located adjacent to a well penetrating said formation, wherein silicon polyhalide in a dry carrier fluid is passed into the said zone, with said silicon polyhalide having a water reactivity substantially equal to that of silicon tetrahalide, the improvement comprising:

neutralizing the acid formed by the reaction between the silicon polyhalide and the water by contacting it with at least one compound of the group consisting of alkene oxides, alkenes, alkadienes, alkatrienes and higher alkapolyenes.

4,506,733

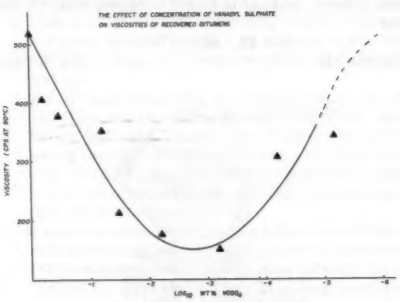
ADDITIVE FOR INCLUSION IN A HEAVY OIL RESERVOIR UNDERGOING STEAM INJECTION

James B. Hyne, and Peter D. Clark, both of Calgary, Canada, assignors to Alberta Oil Sands Technology and Research Authority, Edmonton, Canada

Filed Aug. 19, 1983, Ser. No. 525,349

Int. Cl.[3] E21B *36/00*

U.S. Cl. 166—303 2 Claims



1. A process for reducing the viscosity of heavy oil, comprising:

contacting the heavy oil, at reservoir pressure under substantially anaerobic condition, with an aqueous solution containing at least one metal salt, the metal being selected from the group consisting of Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Mo and Al, and sufficient steam to maintain the temperature in the reaction zone in the range 150°–300° C.

4,506,734

FRACTURING FLUID BREAKER SYSTEM WHICH IS ACTIVATED BY FRACTURE CLOSURE

Kenneth G. Nolte, Tulsa, Okla., assignor to The Standard Oil Company, Chicago, Ill.

Filed Sep. 7, 1983, Ser. No. 530,174

Int. Cl.[3] E21B *43/26*

U.S. Cl. 166—308 6 Claims

1. A method for reducing the viscosity of a fluid introduced into a subterranean formation, comprising:

introducing under pressure a viscosity reducing chemical, contained within hollow or porous, crushable beads, and the fluid into said formation, and

reducing said introduction pressure so any resulting fractures in said formation close and crush said beads, whereby the crushing of said beads releases said viscosity reducing chemical.

4,506,735

OPERATING SYSTEM FOR INCREASING THE RECOVERY OF FLUIDS FROM A DEPOSIT, SIMPLIFYING PRODUCTION AND PROCESSING INSTALLATIONS, AND FACILITATING OPERATIONS WITH ENHANCED SAFETY

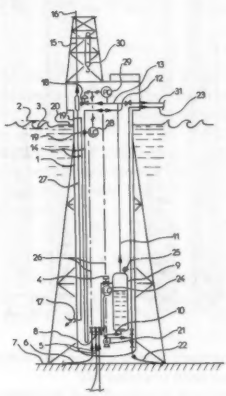
Gerard Chaudot, 14, Allee de La Rochefoucauld, 78570 Andresy, France

Filed Jun. 3, 1983, Ser. No. 500,622

Claims priority, application France, Jun. 8, 1982, 82 09975

Int. Cl.[3] E21B *33/037, 43/017*

U.S. Cl. 166—357 15 Claims



1. In a system of working deposits adapted to increase the recovery of the fluids in situ, including at least one well equipped with an elevated or subsea production head, and at least one pipeline collecting the effluent from the, production head communicating with at least one buffer container and phase separation unit for the effluent at the inlet to processing installations, wherein in order to regulate the input pressure in the installations at a value close to atmospheric pressure at the depth at which said inlet is disposed, the improvement comprising a tube connected to said container or to said separation unit, said tube being a u-tube dipping into the sea at a depth which is a function of the maximum pressure required in the container or the separation unit, and an outlet to the sea of said u-tube opening into a balancing column protecting the air-sea or gas-sea interface from fluctuations due to the condition of the sea and the atmosphere, such as covered by swell or waves; and a tube connected to the atmosphere through an upstream pressure control means permitting the escape of the gas.

4,506,736

PRESSURE BIASED SEAL COMPRESSOR

Robert W. Evans, Huntsville, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Mar. 25, 1983, Ser. No. 479,050

Int. Cl.[3] E21B *23/06*

U.S. Cl. 166—387 11 Claims

1. An improved oil well packer, comprising:

a packer body having a longitudinal bore extending therethrough;

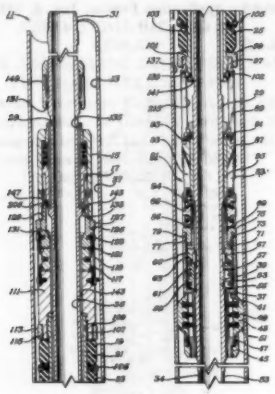
a packer carried on said packer body for sealing off the annular space between said body and a surrounding wall conduit;

a mandrel slidably disposed within said body longitudinal bore, said mandrel having upper connecting means for connecting said mandrel in a pipe string and having a longitudinal passageway extending therethrough for communicating with said pipe string;

sid mandrel being spaced-apart from said body to thereby define a fluid flow path between the exterior of said mandrel and the interior of said body;

passage means communicating said mandrel longitudinal passageway and said fluid flow path;

said mandrel being slidable between an open, running-in position in which said fluid flow path communicates the annular space above said packer with said mandrel longitudinal passageway and a closed, set-position in which said fluid flow path is sealed off;



a face seal housing as a part of said mandrel, said face seal housing forming an upset area in the external diameter of said mandrel, said upset area having an upper extent and a lower extent, the lower extent of said upset area forming a circumferential weight loading-shoulder engageable with said packer body and including a circumferential recess containing a deformable seal portion; and

a pressure biased seal compressor carried between said mandrel and said body for contacting said deformable seal portion when said mandrel is in said closed, set-position to seal off said fluid flow path.

4,506,737

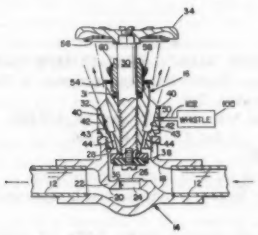
FIRE SPRINKLER

Girard F. Pare, Auburn, Mass., assignor to Daniel J. Donahue, North Hampton, N.H.

Filed May 25, 1983, Ser. No. 497,903

Int. Cl.³ A62C *37/10*

U.S. Cl. 169—19 **19 Claims**



16. In a valve comprising a valve body having one cavity which is adapted for connection to an inlet line through which liquid may flow into said valve and another cavity which provides an outlet through which liquid may flow from said valve, a valve stem extending axially through said body and movable axially relative to said body for controlling flow through a port within said body intermediate said one cavity and said another cavity, said valve stem having a handle attached to one end thereof and defining a valving surface at the other end thereof, that improvement comprising:

an anti-fire liquid flow bore extending from said one cavity of said valve body through said valve body;

a seal removably positioned in said bore to prevent flow of liquid from said inlet line therethrough, and

temperature responsive means retaining said seal in said bore, said means including a first element contacting said seal, a second element contacting a member fixed with respect to said valve body, and a temperature responsive material securing said first element to said second element, said material being adapted to release said second element from said first element when said temperature is above a predetermined temperature and thereby permit liquid from said inlet line to force said seal from said bore and permit flow of liquid from said inlet line outwardly from said valve body through said bore.

4,506,738

LIQUID-PROJECTING MONITOR

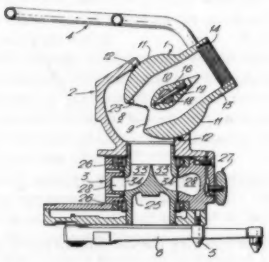
John L. Evans, Chamberley, and Kuldip Bains, Slough, both of England, assignors to Chubb Fire Security Limited, Sunbury-on-Thames, England

Continuation of Ser. No. 243,305, Mar. 13, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 485,798

Claims priority, application United Kingdom, Mar. 13, 1980, 8008524

Int. Cl.³ A62C *27/00*

U.S. Cl. 169—24 **4 Claims**



1. A liquid-projecting monitor comprising a housing, and a head for carrying a nozzle; the head having a frusto-spherical external surface and having a passage within the head for liquid flow to the nozzle; the housing defining together with the head a chamber from which liquid is led into said passage within the head through an inlet thereof and thence through said passage to the nozzle; the head being borne for pivotal movement relative to the housing about a generally horizontal axis so sa to provide adjustment of the angular elevation or depression of the head; the frusto-spherical surface of the head forming a sliding seal against a portion of the housing to maintain the aforesaid chamber liquid-tight throughout the permitted range of said pivotal movement; the cross-sectional area of said chamber immediately upstream of the inlet of said passage being substantially greater than the cross-sectional area of said inlet; said inlet being of generally elliptical cross-section with the longer cross-sectional dimension thereof being generally parallel with the axis about which the head pivots relative to the housing and throughout at least a major part of the range of pivotal movement of the head relative to the housing both

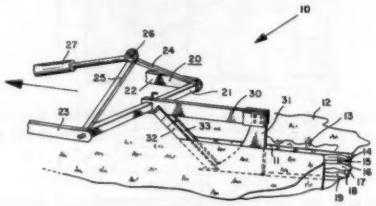
the upper and lower margins of said inlet remaining spaced from the internal surface of the housing; and the head being so configured that the cross-sectional area of said passage within the head which is available for liquid flow is at least approximately constant throughout the length of said passage.

4,506,739

METHOD AND APPARATUS FOR RECONDITIONING AND AERIFYING TURF

Thomas C. Mascaro, Turfgrass Products Corp., P.O. Box 610366, North Miami, Fla. 33161

Filed Dec. 22, 1983, Ser. No. 564,571
Int. Cl.³ A01B *45/02*
U.S. Cl. 172—21 **15 Claims**



1. Apparatus for use in reconditioning and aerating turf by cutting grooves in the turf and depositing slivers of the turf alongside the groove, comprising:

frame means adapted to be coupled to a traction vehicle movable forwardly on the turf,

at least on plow member depending from said frame means, said plow member having a tip adapted to penetrate said soil and an edge extending upwardly and rearwardly from said tip,

a pair of blades depending from said frame means ahead of said plow member with a space therebetween, said blades having leading edges with upper and lower portions for slicing through said soil and sod as said vehicle advances, each of said blades also having insides and outsides and lower end portions loosely engaging opposite sides of said plow member adjacent its tip,

the upper portion of the leading edge of each blade being defined by an intersecting pair of beveled surfaces and the lower portion of the leading edge of each blade being defined by a beveled surface extending rearwardly and outwardly from the inside of the blade to its outside, and

means maintaining said blades disposed at a small dihedral angle relative to one another and with their trailing edges spaced further apart than their leading edges,

whereby the blades cooperate with the plow member to cut a groove in the turf and to remove slivers of soil and sod as the frame is advanced along the turf.

4,506,740

VIBRATING EARTH RIPPING APPARATUS

Orvil L. Carter, Rte. 2, Box 0, Canadian, Tex. 79014

Filed Mar. 2, 1983, Ser. No. 471,223
Int. Cl.³ A01B *13/08, 49/02*
U.S. Cl. 172—40 **13 Claims**

12. A vibrating earth ripping apparatus comprising:

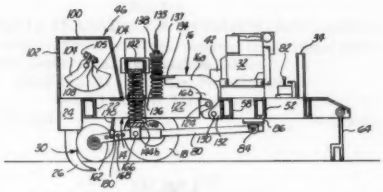
a wheel supported main frame having a forward end and a rear end;

a pair of thrust absorbing arms having each arm pivotally connected to the main frame for pivotation about a horizontal pivotal axis;

a vibrating frame having a rear end having a forward end pivotally connected to said thrust absorbing arms at pivot points spaced from said pivotal axis for pivotally transferring forward and then rearward thrust to said thrust absorbing arms to thereby pivot said thrust absorbing arms upwardly then downwardly about said pivotal axis;

means resiliently opposing upward and downward pivotal movement of said thrust absorbing arms, said resilient opposing means beng mounted between said vibrating frame and said thrust absorbing arms;

teeth connected to the rear end of said vibrating frame for movement with said vibrating frame;



means for developing periodically recurring, variously directed movements of said vibrating frame;

means resiliently resisting upward movement by said vibrating frame; and

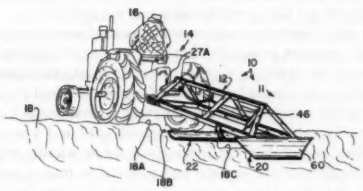
means for hydraulically selectively adjusting the depth to which said teeth penetrate the earth while said vibrating frame is undergoing said variously directed, periodically recurring movements.

4,506,741

LEVEE GATE CUTTER

Melvin F. Hula, Jr., Rte. 1, Box 84, De Valls Bluff, Ark. 72041

Filed Apr. 7, 1983, Ser. No. 482,822
Int. Cl.³ A01B *3/76, 5/00*
U.S. Cl. 172—445.1 **2 Claims**



2. A device for installing plastic lined irrigation gates in levees, said device comprising:

elongated, rigid, frame means having three-point hitch means at one end adapted to be coupled to a tractor or other tow vehicle, said frame means having a length, a width and a rear end, said frame means capable of assuming ground engaging and levee clearing positions and comprising a plurality of elongated, rigid, parallel spaced apart struts;

rigid scoop means operatively coupled to said frame means rear end for first opening a hole in a levee when said machine is moved therethrough, the scoop means being of concave cross section; the concavity facing outwardly away from the frame means rear end, and said scoop means having a length greater than said frame means width and being substantially centered with respect to said frame means;

elongated dipper blade means pivotally coupled to said frame means in spaced-apart, generally parallel relation with respect to said scoop means for forming a trench adjacent said levee hole generally parallel to said levee, said dipper blade means being of concave cross section and having a length greater than the length of said scoop means; and being centered with respect to said frame means;

means for moving said dipper blade means between dirt cupping and dirt release positions whereby dirt removed from said trench may be redeposited upon plastic lining subsequently installed in said trench and hole, said last mentioned means coupled to the rear of said frame means and operationally extending between said frame means said dipper blade means.

4,506,742

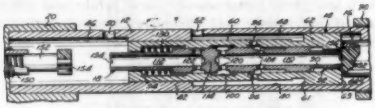
VIBRATIONLESS PERCUSSION TOOL

Yutaka Fukase, Kamagaya, Japan, assignor to M Group Corporation, Newport Beach, Calif.

Filed Apr. 29, 1983, Ser. No. 490,137

Int. Cl.³ E21B *1/00*; F01L *21/04*

U.S. Cl. 173—4 **14 Claims**



1. A vibrationless percussion tool comprising:

a casing in which vibrations are undesirable, said casing including a vent control chamber in constant communication with the atmosphere and a piston control chamber having a first portion and a second portion;

an anvil positioned adjacent one end of said casing adapted to transmit an applied impact force to a working surface;

means for applying a pressurized fluid into said casing;

a piston reciprocally mounted for upstroke and downstroke travel within said casing having a first surface continuously exposed to the pressurized fluid and a second surface, larger than the first surface, intermittently exposed to the pressurized surface and adapted to impact said anvil, said piston having a central passage therein; and

a mechanically actuated valve disposed within the interior of said piston and mounted to reciprocally travel in unison with said piston except during mechanical actuation adjacent the extreme upstroke and downstroke position of said piston within said casing, said mechanically actuated valve comprising a spool valve mounted within said central passage between a first stop adjacent a first end of said piston and a second stop adjacent a second end of said piston, said spool valve including a first valve passage in fluid communication with said vent control chamber and a second valve passage in fluid communication with said second portion of said piston control chamber, said first and second valve passages extending axially into said spool valve, said spool valve including a wall separating said first and second valve passages to prevent direct fluid flow therebetween, said first valve passage including a first port adjacent said wall for providing fluid flow into and out of said first valve passage, said second valve passage including a second port adjacent said wall for providing fluid flow into and out of said second valve passage, said spool valve upon contacting said first and second stops, alternately venting and applying the pressurized fluid to the second surface of said piston to reciprocate said piston against the pressurized fluid continuously applied to the first surface of said piston.

4,506,743

LATCHING ARRANGEMENT FOR POWER TOOLS

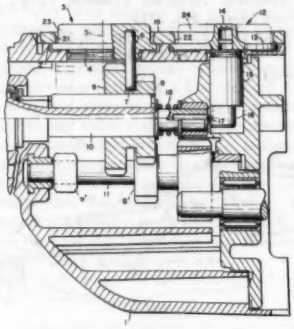
Horst Grossmann, Huenfelden-Kirberg, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 12, 1982, Ser. No. 441,415

Claims priority, application United Kingdom, Nov. 13, 1981, 8134220

Int. Cl.³ B25D *11/00*

U.S. Cl. 173—48 **7 Claims**



1. A power tool, comprising:

means for changing the speed of the tool;

means for changing the mode of operation of the tool;

two control members, one operatively connected to said speed changing means and the other to said mode changing means;

each control member being rotatable and having a disc portion with two diametrically opposed peripheral recesses;

a detachable cover member forming part of the housing of the tool and having two apertures therein, said control members protruding through said apertures, and said apertures being dimensioned smaller than said disc portions whereby said cover plate retains said control members in the tool;

a pair of latch components mounted opposite each other on the under side of said cover member, each latch component comprising two oppositely extending resilient arms having detent portions engageable in said recesses to latch said control members individually in selectable positions upon rotation thereof.

4,506,744

PILE HAMMER

Robin Dawson, Bletchley, England, assignor to Dawson Construction Plant Limited, Luton, England

Filed Sep. 8, 1981, Ser. No. 299,877

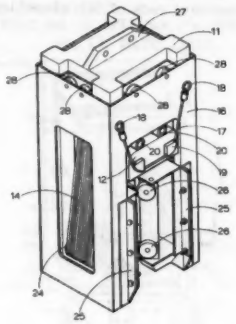
Claims priority, application United Kingdom, Sep. 10, 1980, 8029203

Int. Cl.³ B25D *45/16, 11/04*; E21C *3/02*; E21B *4/06*

U.S. Cl. 173—131 **14 Claims**

1. A hammer for driving piles, comprising an anvil having a surface adapted to rest on top of a pile to be driven, a weight arranged to travel through a stroke between an upper position and a lower position, and at least one flexible member mechani-

cally connecting the anvil and the weight and having a preselected length such that when the weight travels to its lower position, said member is in tension and prevents the weight striking the anvil.

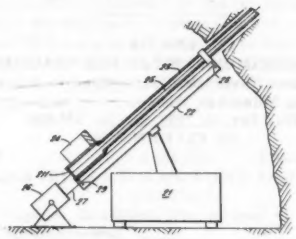


4,506,745

METHOD AND MEANS FOR DRILLING IN ROCKS

Hakon E. Bjor, Hvalstad, Norway, assignor to Bever Control A/S, Heggedal, Norway

Continuation of Ser. No. 435,880, Oct. 21, 1982, abandoned. This application May 9, 1984, Ser. No. 608,533
Claims priority, application Norway, Oct. 22, 1981, 813562
Int. Cl.[3] E21B *47/02*
U.S. Cl. 175—45 **9 Claims**



1. A method for drilling straight holes of long length in solid rock by the use of a drill rig including a hollow longitudinal rotating drill stem having at the end thereof a drill bit, said method comprising:

providing as an integral portion of said drill stem a hollow control means having pressure means for moving said hollow control means relative to the wall of a hole drilled by said drill stem, with said hollow control means being located rearwardly of said drill bit a distance sufficient to cause said drill stem to bend upon operation of said pressure means to move said hollow control means relative to said wall of said hole, and thus for controlling the direction of said drill bit and the direction of said hole formed thereby;

directing a laser beam longitudinally through said drill stem and into and through said hollow control means;

detecting the relative position of said laser beam with respect to the bend of said drill stem by means of an optical detecting unit positioned within said hollow control means, and generating signals representative thereof within said hollow control means; and

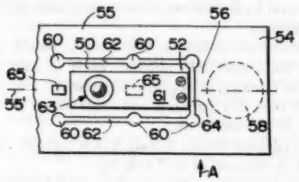
processing said signals within said hollow control means and operating said pressure means to move said hollow control means relative to said wall of said hole and thereby to bend said drill stem while said drill bit remains in a locked position in said rock, thereby controlling the direction of drilling by said drill stem.

4,506,746

GAGED PLATE TRANSDUCER WEIGHING APPARATUS

Harry E. Lockery, Sudbury, Mass., assignor to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed Sep. 27, 1982, Ser. No. 424,485
Int. Cl.[3] G01G *3/14, 3/08*
U.S. Cl. 177—211 **14 Claims**

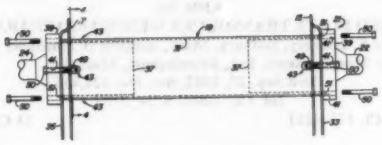


1. A strain gage weighing apparatus having upper and lower horizontal members arranged in substantially parallel planes relative to each other, said upper horizontal member comprising platform means for receiving a load to be weighed, said lower horizontal member comprising strain gage transducer beam means for measuring the weight of a load, load transfer means operatively arranged between said upper and lower horizontal members for transmitting vertical force components from the upper horizontal member to the strain gage transducer beam means while substantially preventing the transmission of horizontal force components between said upper and lower horizontal members, and foot means for stabilizing the weighing apparatus, said lower horizontal member comprising at least two elongate elements joined to form said lower horizontal member as a rigid frame structure, said strain gage transducer beam means being constructed as integral parts of said two elongate elements adjacent the ends thereof; said foot means being operatively arranged relative to the ends of said two elongate elements for applying a load representing force to each of the respective integral strain gage transducer beam means through said transfer means from the upper horizontal member to said strain gage transducer beam means, wherein said integral strain gage transducer beam means are spaced from the end of the respective elongate element, each of said transducer beam means having a root end merging into the respective elongate element in the direction of the center of said elongate element and a free end extending in the direction toward the outer end of said elongate element for flexural movement of the integral strain gage transducer beam means relative to said elongate element, said free end of the transducer beam means being spaced from the respective end of the respective elongate element (55) for defining a non-flexural frame element area (56) between the free flexural end (52) of the transducer beam means (50) and the end (54) of said elongate element (55), whereby said transducer beam means (50) is surrounded along all edges thereof by the respective elongate element (55), securing means for securing said foot means to said non-flexural frame element area (56) at the end of said elongate elements (55) outside of the respective transducer beam means (50), and wherein said load transfer means include a bracket between said upper member and the free flexural end (52) of the respective transducer beam means (50) for deforming the latter.

4,506,747
AXLE TUBE AND HYDRAULIC MOTOR HOUSING MOUNTING ARRANGEMENT

Lloyd A. Wykhuis, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed Sep. 20, 1982, Ser. No. 419,666
Int. Cl.[3] B60K 7/00
U.S. Cl. 180—62 2 Claims



1. An axle and hydraulic motor mounting arrangement for a vehicle comprising:

(a) a vehicle having first and second sidewalls generally parallel and oppositely aligned, each of said sidewalls having an opening in opposite alignment;

(b) an axle tube having each end received in a respective opening of said sidewalls;

(c) a first hydraulic motor having a first section sized to be received in one end of said axle tube;

(d) a second hydraulic motor having a first section sized to be received in the other end of said axle tube;

(e) means for fixably mounting said axle tube to said first and second hydraulic motors and said sidewalls, said means including said first and second motors having a flanged portion and said sidewalls having a flanged portion such that said flanged portion of each said respective sidewalls is sandwiched between a respective end of said axle tube and said flange of said respective motor; a plurality of nuts; said axle tube having a plurality of keyways spaced around each respective end, and sized to receive a respective one of said nuts such that said bolt cannot experience rotational motion; a plurality of bolts, each of said bolts extending through said flange of said respective hydraulic motor and said respective flange portion of said sidewall into said respective keyway to be threadably engaged in a respective nut.

4,506,748
BATTERY SHOCK ELIMINATOR

David A. Thomas, 1915 Nugget Dr., Clearwater, Fla. 33515

Filed May 23, 1983, Ser. No. 497,183
Int. Cl.[3] B62D 25/00; B60R 18/02
U.S. Cl. 180—68.5 9 Claims

1. An assembly for mounting a wet cell battery, said assembly of the type designed to attenuate the amplitude of externally imparted forces impinging upon said battery, comprising,

a vehicle having a frame portion,

a base member of predetermined dimension and configuration,

said base member being fixedly secured to said frame of said vehicle and movable therewith,

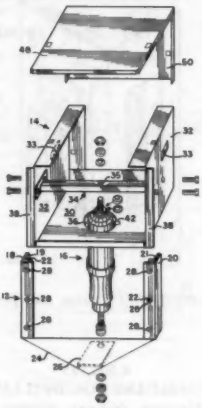
a housing member for housing said battery,

means for slideably interconnecting said base member and said housing member so that said members are movable relative to one another in a vertical plane and so that said housing member is not mounted on said frame portion of said vehicle,

a shock attenuating means disposed in interconnecting relation to said base and housing members so that forces impinging against said frame portion of said vehicle are attenuated attendant relative movement of said base and housing members and the dampening action of said attenuating means,

said means for slideably interconnecting said base member and said housing member including a pair of laterally spaced, upstanding channel-defining members,

a vertically disposed plate member interconnecting the respective lowermost ends of said channel-defining members,



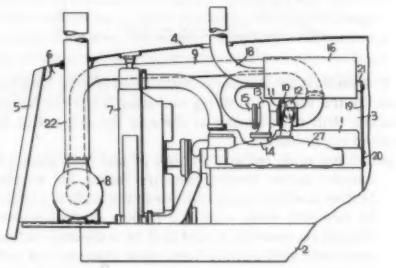
a horizontally disposed platform means fixedly secured to said plate member in cantilever relation thereto,

and said platform means adapted to securely engage a lower end of said shock attenuating means so that said lower end of said attenuating means is displaced attendant displacement of said frame portion of said vehicle.

4,506,749
UNDERHOOD MUFFLER FOR TRACTOR

Gerald E. Sieren, Greendale, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1981, Ser. No. 335,595
Int. Cl.[3] F01N 7/08
U.S. Cl. 180—69.2 9 Claims

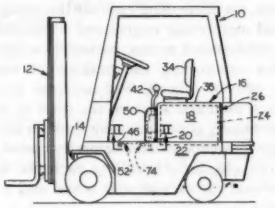


1. An underhood muffler for an internal combustion engine on a tractor comprising, an engine hood defining an engine compartment, an internal combustion engine in the engine compartment, a muffler carrying an exhaust pipe mounted between said hood and engine, said exhaust pipe extending through an opening in said hood, an exhaust manifold on said engine, an exhaust gas passage means partially supported by said exhaust manifold and partially supporting said muffler, a flexible muffler support plate mounted on said engine partially and nonrotatably supporting said muffler on at least two points and allowing axial thermal expansion of said muffler during normal operation.

4,506,750
PIVOTAL HOOD ARRANGEMENT

Edward V. Leskovec, Eastlake, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 18, 1983, Ser. No. 514,436
Int. Cl.[3] B62D *25/10*
U.S. Cl. 180—69.21 19 Claims



1. In a vehicle (10) having a hood (18) and a source of motive power (24), said hood (18) being pivotally connected to said vehicle (10) and pivotally movable between covering (26) and uncovering (28) positions relative to said source of motive power (24); the improvement comprising:

an opening (48) disposed in said vehicle (10);

a control device (38) mounted on said hood (18) and movable with said hood (18), said control device (38) being disposed in said opening (48) at the uncovering position (28) of said hood (18);

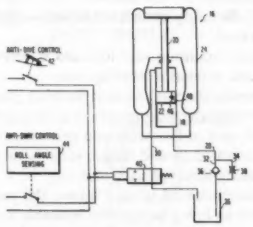
a door (54) connected to said vehicle (10) and being movable between open and closed positions (57,59) relative to said opening (48), said door (54) being movable to said open position (57) in response to pivotal movement of said hood (18) to the uncovering position (28); and

means (70) for urging said door (54) to the closed position (59) and for positively retaining said door (54) at the closed position (59) in response to said hood (18) being at the covering position (26).

4,506,751
TILT CAB TRUCK WITH ANTI-DIVE AND ANTI-SWAY CONTROL

Robert Stephens, Brookfield, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Dec. 21, 1982, Ser. No. 452,990
Int. Cl.[3] B62D *27/04*
U.S. Cl. 180—89.15 36 Claims



1. A tilt-cab truck comprising:

(a) a chassis;

(b) a cab mounted on said chassis and pivotable with respect to said chassis about an axis;

(c) a roll-angle sensing device;

(d) a shock absorber assembly disposed between said chassis or said cab, said shock absorber assembly comprising:

(i) a shock absorber cylinder mounted on one of said chassis and said cab;

(ii) a shock absorber rod mounted on the other of said chassis and said cab;

(iii) a shock absorber piston carried by said shock absorber cylinder;

(iv) a reservoir for shock absorber fluid;

(v) a first path of fluid communication connecting said reservoir to the interior of said shock absorber cylinder on the downstroke side of the normal position of said shock absorber cylinder, said first path of fluid communication containing a one-way valve which permits flow to said shock absorber cylinder but prevents flow to said reservoir;

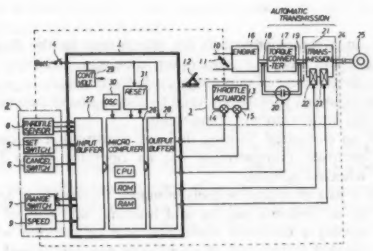
(vi) a second path of fluid communication connecting said reservoir to the interior of said shock absorber cylinder on the downstroke side of the normal position of said shock absorber cylinder, said second path of fluid communication containing a fluid flow restrictor which permits restricted flow in either direction; and

(vii) a third path of fluid communication connecting said reservoir to said shock absorber cylinder on the upstroke side of the normal position of said shock absorber piston, said that path of fluid communication containing a valve which in a first position permits flow in either direction and in a second position prevents flow in both directions, wherein said valve in said third path of fluid communication is operatively connected to said roll-angle sensing device such that said valve is placed in its first position when said roll-angle sensing device senses a roll angle less than a predetermined value and is placed in its second position when said roll-angle sensing device senses a roll angle greater than the predetermined value.

4,506,752
AUTOMATIC RUNNING CONTROL METHOD FOR A VEHICLE

Kiyoshi Hara, Obu; Yozo Inoue, and Munetaka Noda, both of Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 30, 1982, Ser. No. 430,607
Claims priority, application Japan, Oct. 27, 1981, 56-171615
Int. Cl.[3] B60K *31/00*
U.S. Cl. 180—179 3 Claims



1. An automatic running control method for a vehicle which comprises:

a prime mover for generating a revolving driving force,

a throttle controlling means for controlling said revolving driving force according to a first controlling signal,

a transmission means including a torque converter and a transmission which delivers said revolving driving force of said prime mover to a wheel,

a lock-up clutch for alternatively connecting and interrupting an input and an output shaft of said torque converter according to a second controlling signal,

a transmission ratio adjusting means for determining a trans-

mission ratio of said transmission according to a third controlling signal,

an indicating means for generating a start signal and an end signal indicating respectively the start and end of an automatic cruising mode,

said method comprising the steps of:

converting the actual running speed of the vehicle to a speed signal;

converting the actual running load of the vehicle to a load signal;

generating a mode signal, indicative of operation of said automatic cruising mode, whenever said start signal is generated and the value of said speed signal is greater than a predetermined value set by a first standard signal, and ceasing generation of said mode signal whenever said end signal is generated;

holding said speed signal as a reference signal during generation of said mode signal;

adjusting said throttle controlling means by generating said first controlling signal so as to minimize the difference between said speed signal and said reference signal;

adjusting said transmission ratio adjusting means by generating said third controlling signal to adjust said transmission ratio in accordance with a predetermined relationship with said speed signal and said load signal;

controlling the generation of said second controlling signal to control said lock-up clutch in accordance with a predetermined relationship with said speed signal and said load signal; and

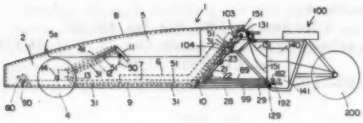
overriding previous control of said second controlling signal so as to cause connecting of said lock-up clutch during generation of said mode signal.

4,506,753

REMOVEABLE FORECAB FOR MOTORCYCLES

David D. Wood, Jr., 1402 Stout, Urbana, Ill. 61801

Filed Jun. 12, 1981, Ser. No. 273,090
Int. Cl.³ B62D *61/06*
U.S. Cl. 180—210 **6 Claims**



1. In a removeable cab for attachment to the front of a motorcycle having a telescoping tube-mounted front wheel, after detachment of said motorcycle front wheel, to produce a three-wheeled vehicle powered by the engine of said motorcycle, the improvements comprising:

(a) an elongated housing defining therewithin an openable, enclosed compartment for an operator of said three-wheeled vehicle,

(b) a pair of spaced wheels mounted forwardly of and each on an opposite side of said housing, said pair of wheels having a common horizontal axis of rotation which is parallel to the axis of rotation of the rear wheel of said motorcycle,

(c) means for mounting and attaching the rear of said housing to said front of said motorcycle, after removal from said motorcycle of said front wheel and the fork tubes supporting the same in suspension brackets of said motorcycle, said housing attaching means including a pair of spaced, vertically inclined tubular members of such dimensions to be adapted to be slideably received in releaseable, fixed engagement within said suspension brackets of said motorcycle, said housing attaching means further including means for anchoring said pair of tubular members so that said tubular members are fixedly positioned vertically and releaseably and adjustably, fixedly positioned horizontally with respect to said rear of said housing, and

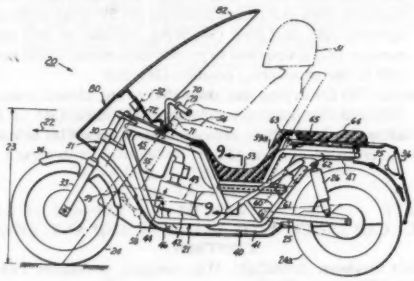
(d) means, located within said housing, for controlling said three-wheeled vehicle, including handlebar means for controlling the direction of travel of said vehicle, separate, hand-actuated means, each mounted on said handlebar means and cooperatively communicating through separate cable means with the respective controls on said motorcycle, for controlling each the throttling and clutching of said motorcycle engine and transmission, respectively, hand-actuated means, mounted on said handlebar means, for controlling the braking of said housing-mounted pair of wheels, and separate pedal-actuated means, each mounted adjacent the floor of said housing and cooperatively communicating through separate lever-rod linkage members with the respective pedal controls on said motorcycle, for controlling each the braking and shifting of said motorcycle rear wheel and transmission, respectively.

4,506,754

MOTORCYCLE FRAME WITH ADJUSTABLE AND COMPACT RIDER SUPPORT

Seiji Hirano, Fullerton, and Raymond N. Weyl, Lawndale, both of Calif., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 18, 1982, Ser. No. 409,146
Int. Cl.³ B62J *1/00*
U.S. Cl. 180—219 **11 Claims**



1. A motorcycle comprising:

a frame having a forwardly-directed axis and a dimension of height;

an engine mounted to said frame;

a rear wheel drivingly connected to said engine;

a forward wheel;

a steering post mounting said forward wheel to said frame and rotatable around a steering axis;

a steering means attached to said steering post for turning the post to steer the motorcycle, said forward wheel being forward of, and in line with said rear wheel;

seat means mounted to said frame, slidably adjustable along said forwardly-directed axis; and

footrest means mounted to said frame, the position of said footrest means being adjustably movable relative to said frame whereby the distance between said seat means and said footrest means is adjustable, said footrest means being located sufficiently forwardly of said seat means that the feet of a rider seated on said seat means will be axially forward of his knees, all as viewed in plan, said footrest means including an arm mounted to said frame and disposed at an angle to said forwardly-directed axis; and a footrest attached to said arm so that movement of the arm moves the footrest.

4,506,755

REAR SUSPENSION SYSTEM FOR MOTORCYCLES

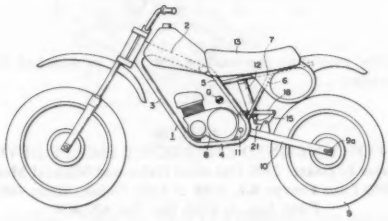
Tetsuo Tsuchida, 1-25-6, Nishi-mizuhodai, Fujimi-shi, Saitama, and Satoru Horiike, 6-13-11, Shimo-shakujii, Nerima-ku, Tokyo, both of Japan

Filed Dec. 10, 1982, Ser. No. 448,643

Claims priority, application Japan, Dec. 11, 1981, 56-200385; Feb. 5, 1982, 57-18051

Int. Cl.³ B62K *25/04*

U.S. Cl. 180—227 **8 Claims**



1. In a motorcycle having a body frame and a rear wheel, a rear suspension system comprising:

a rear wheel supporting member having the front end thereof swingably connected to said body frame, and pivotably supporting at the rear end thereof said rear wheel;

a damper pivotably secured to said body frame;

a progressive link mechanism having first and second pivot points pivotably connected to said damper and said rear wheel supporting member, respectively, said progressive link mechanism progressively transmitting the movement of said second pivot point to said first pivot point;

said progressive link mechanism being disposed substantially above said rear wheel supporting member; and

said progressive link mechanism comprising a first link member provided at a front portion thereof with said first pivot point and at substantially an intermediate portion thereof with said second pivot point, and at least one second link member pivotably connected at the rear end thereof to a rear portion of said first link member and at the front end thereof to said body frame, said second link member being disposed so as to cross said damper in side elevation.

4,506,756

TRACTOR WITH IMPROVED FRAME CONSTRUCTION

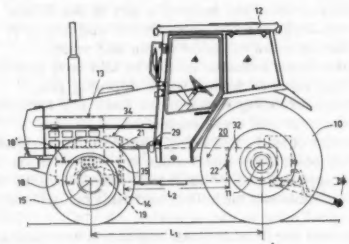
Rauno Bergous, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Filed May 24, 1983, Ser. No. 497,728

Claims priority, application Finland, May 25, 1982, 821852

Int. Cl.³ B62D *21/16*

U.S. Cl. 180—291 **11 Claims**



1. In a farm tractor or the like including a supporting frame assembly on which are mounted an engine, a drive transmission including a gearbox, and front and rear wheel axles, said tractor further including a fuel tank, the improvement comprising, in combination:

said engine is situated at a forward end of the tractor substantially above the front wheel axle;

said transmission gearbox is situated at a rearward end of the tractor;

said fuel tank is situated between said engine and said transmission gearbox, and wherein said fuel tank comprises an elongate box-beam shaped member constituting a load carrying part of said supporting frame assembly of the tractor extending over a substantial part of the length of the tractor.

4,506,757

TRACK TYPE VEHICLE PROVIDING FOR READY DISMOUNTING AND REMOUNTING OF POWER TRAIN COMPONENTS

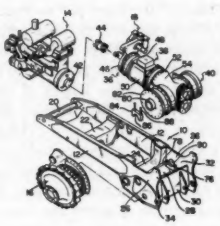
Takeshi Matsumoto, Hirakata; Shuji Yoshida, Sakai, and Katsuji Shikimi, Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 20, 1983, Ser. No. 505,705

Claims priority, application Japan, Jun. 24, 1982, 57/107612

Int. Cl.³ B60K *9/00*

U.S. Cl. 180—294 **10 Claims**



1. A track type vehicle comprising:

(a) a frame including a pair of spaced apart main frame members extending longitudinally of the vehicle, the main frame members being rigidly connected to each other;

(b) an internal combustion engine mounted on the frame adjacent one end thereof;

(c) a pair of final drives secured externally to the respective main frame members adjacent the other end of the frame;

(d) a power train assembly separably connected to the engine for controllably transmitting the rotation thereof to the final drives, the power train assembly comprising a series of power train components, including a steering mechanism, separably connected to each other, the steering mechanism having a pair of output shafts in alignment with each other about an axis extending transversely of the vehicle, the output shafts of the steering mechanism being separably connected to the respective final drives;

(e) first support means for detachably supporting the power train assembly on the frame in a position closer to the engine; and

(f) second support means for supporting the steering mechanism of the power train assembly on the main frame members both detachably and for pivotal motion about the aligned axis of its output shafts;

(g) whereby the power train assembly is either wholly dismountable from the frame or pivotable relative to the frame about the aligned axis of the output shafts of the steering mechanism for individually dismounting the power train components other than the steering mechanism.

4,506,758

HIGH FREQUENCY REACTION MASS AND HYDRAULIC CYLINDER ASSEMBLY

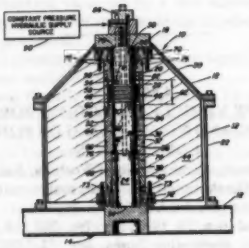
Delbert W. Fair, 2221 E. Hartford, Ponca City, Okla. 74601

PCT No. PCT/US79/00591, § 371 Date Apr. 8, 1981, § 102(e) Date Feb. 23, 1981, PCT Pub. No. WO81/00460, PCT Pub. Date Feb. 19, 1981

Continuation of Ser. No. 270,535, Apr. 8, 1981, abandoned. This PCT application Aug. 8, 1979, Ser. No. 640,216

Int. Cl.³ G01V *1/135, 1/04;* F01B *15/00*

U.S. Cl. 181—119 **6 Claims**



1. A seismic transducer apparatus for operation over an operating frequency range extending into the higher seismic frequency range above 80 cycles per second, comprising: a frame; a vertical double rod-end piston member, including a drive piston with upper and lower rods extending from said drive piston and having axial ends attached to said frame, said lower rod being about twice the length of the upper rod; a reaction mass member reciprocally disposed about said piston member and forming a hydraulic drive cylinder around said drive piston; and a hydraulic biasing cylinder formed between an upward facing shoulder of said lower rod and a downward facing shoulder of said reaction mass member; first port means directed for communication adjacent the lower rod with the biasing cylinder; second and third port means directed axially through the short upper rod for communication above and below the drive piston, respectively, with the drive cylinder; hydraulic valve control means mounted proximate the axial end of the upper rod in control communication with said second and third port means; whereby said biasing cylinder is located below said drive cylinder to minimize the length of fluid port means supplying fluid to said drive cylinder through increasing the natural frequency of the spring-mass system represented by the mass of said frame and the spring constant of the trapped fluid in said drive cylinder and said second and third port means to a value above said operating frequency range.

4,506,759

LOUDSPEAKER ENCLOSURE ARRANGEMENT FOR VOICE COMMUNICATION TERMINALS

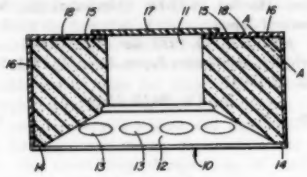
Peter Fatovic, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 20, 1983, Ser. No. 506,047

Int. Cl.³ H05K *5/00*

U.S. Cl. 181—151 **18 Claims**

1. An electro-acoustic transducer comprising, a small loudspeaker having a voice coil structure and a conical diaphragm supported by a spider having a peripheral edge defining the shape of the loudspeaker, a piece of resilient open cell foam material having a shape complementary similar to that of the loudspeaker and including an opening at its approximate geometrical center to permit close-fitting engagement with said voice coil structure and means for securing the peripheral edge of one face of said foam material to said peripheral edge of the spider, the outer surface of the foam material being covered with a flexible layer of substantially air-impermeable material,



thereby providing the loudspeaker with an attached flexible enclosure.

4,506,760

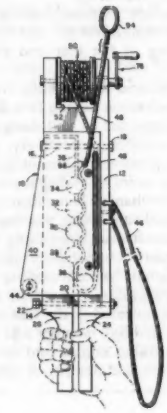
SELF-CONTAINED EMERGENCY ESCAPE DEVICE

Charles L. Baker, 2900 Oakwood Oaks, and Mickeal Mannino, 3590 Lake George Rd., both of Lake Orion, Mich. 48035

Filed Aug. 6, 1984, Ser. No. 637,804

Int. Cl.³ A62B *1/14*

U.S. Cl. 182—5 **10 Claims**



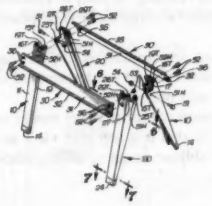
1. A self-contained, emergency escape device comprising:
(a) a first, larger jaw,
(b) a second, smaller cooperating jaw,
(c) a first grip formed at the lower end of said first jaw and a second grip formed at the lower end of said second jaw,
(d) means mounting said jaws so that said jaws can be moved relative to one another,
(e) a sling secured to one of said jaws and adapted to be positioned about the body of a user of the device,
(f) a yoke defined at the upper end of said first jaw,
(g) a take-up spool mounted within said yoke,
(h) brake means mounted on one of said jaws and complementary recesses defined in the opposing jaw,
(i) a cable extending between the jaws in a tortuous path passing over said brake means,
(j) one end of said cable being adapted to be secured to an anchor point from which a descent is to be made, and
(k) the opposite end of said cable being secured to said take-up spool and the bulk of said cable being wound upon said spool prior to use, whereby,
(l) said jaws are moved closer together when manual pressure is applied to said grips to increase the frictional forces exerted upon the cable, thus varying the rate at which said cable is unwound from said take-up spool during operation.

4,506,761

SAWHORSE FRAME WITH STRONG CLAMPING ACTION AND COMPACT FOLDING FEATURE

James M. Brown, 12031 Lopez Canyon Rd., San Fernando, Calif. 91342

Filed Mar. 28, 1983, Ser. No. 479,753
Int. Cl.³ F16M *11/00*
U.S. Cl. 182—186 **8 Claims**



1. A sawhorse frame for use with a disposable top member and comprising:

two substantially identical formed sheet-metal left legs, one for use on each face of the sawhorse, each of the left legs being of unitary C-beam cross-sectional configuration wherein:

the closed end of the C is generally planar and adapted to be parallel to the sawhorse face, and defines near the upper end of the leg two assembly-fastener holes,

one side of the C is generally planar and tapered from a relatively narrow foot portion at the lower end of the leg to a relatively wide hinge portion near the upper end of the leg, and is further cut away above the hinge portion to form a support for such top member and a clamping jaw for receiving and engaging one side of such top member, and

the hinge portion defines a hinge-fastener hole;

two substantially mutually identical formed sheet-metal right legs, one for use on each face of the sawhorse,

each of the right legs being of unitary C-beam configuration that is substantially a mirror image of the said configuration of the left legs, and

the left and right legs being adapted for assembly in pairs to form two inverted-V structures, one left leg and one right leg constituting one pair, by passing a hinge fastener through the hinge-fastener holes of each pair of legs and securing the hinge fasteners to the said pairs,

whereby the respective clamping jaws of paired legs when so assembled form pairs of clamping jaws, each pair adapted to clamp and thereby to secure one end of such disposable top member;

two substantially mutually identical formed sheet-metal cross members, each cross member being of unitary open-Z cross-sectional configuration wherein:

the connecting member of the Z is generally planar and adapted to be juxtaposed at one of its ends to the closed end of the C shape of one of the right legs and at the other of its ends to the closed end of the C shape of one of the left legs, near the respective tops of the right and left legs, and the connecting member of the Z is further adapted to be disposed parallel to the face of the sawhorse, and the connecting member of the Z defines near each of the ends of the cross members at least two assembly-fastener holes adapted for alignment with the said assembly-fastener holes in the closed ends of the C shapes of the legs,

the top arm of the Z is adapted to lie above the top ends of one of the left legs and one of the right legs, and to project inwardly from the face of the sawhorse toward the top arm of the Z of the other cross member, said top arm of the Z being dimensioned so as not to engage such disposable top member when the latter is received and secured, and

the bottom arm of the Z is adapted to project outwardly from the face of the sawhorse; and

two hinge fasteners and at least eight assembly fasteners.

4,506,762

UTILITY POLE AND TREE CLIMBING AID

Ernest G. Bednar, 2905 Highland Ct., Arcata, Calif. 95521

Filed Mar. 24, 1983, Ser. No. 461,499
Int. Cl.³ A63B *27/00*
U.S. Cl. 182—221 **2 Claims**

1. A pair of standard tree and utility pole climbing spurs are usually composed of vertical metal bars positioned on the inside of the lower portion of the legs of the climber starting just below the knees and extending downward below the insteps and thence curving under the shoes and a short distance up the outside of said shoes at which point straps are attached which are buckled around the ankles; the upper portion of the bars usually have a padded metal portions attached to them at right angles which curve around the front of the shins and are attached to the legs at this point by straps which encircle the legs just below the knees; strap spurs are attached to the bars just outside the insteps above the point at which the bars curve under the shoes, to engage the tree or pole in the climbing process; the extraction of which, coupled with the inherent weight of the climbing spurs tend to create an undue strain on the knee joints of the climber; the climber normally also wears a safety climbing belt around his waist with a strap or rope which is attached to 'D' rings on the belt and encircles the pole being climbed; the improvement comprising a harness composed of a pair of padded cup shaped knee pads attached to the shin guards at the upper portion of the climbing spurs by adjustable straps which position the knee pads over the knee caps; attached to the upper portion of said cup shaped knee pads are adjustable straps with swivel harness snaps which are in turn attached to the 'D' rings of the safety belt, thereby transmitting the pulling force, necessary for lifting the heavy spurs and the extraction of said spur points from the pole, to the top of the knee caps and thence to said safety belt around the waist of the climber thereby relieving the unnatural strain on the knee joints of the climber.

4,506,763

CONVEYOR AND/OR CHAIN LUBRICATION APPARATUS

Charles C. Frost, Ada, and Siegfried K. Weis, Byron Center, both of Mich., assignors to Conveyor Maintenance & Supply, Inc., Grand Rapids, Mich.

Filed Jun. 18, 1982, Ser. No. 389,955
Int. Cl.³ F16N *7/00*
U.S. Cl. 184—15.2 **37 Claims**

1. Lubrication apparatus for lubricating a moving conveyor apparatus comprising:

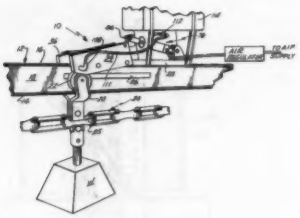
lubricant direction means adapted to be positioned adjacent a moving conveyor apparatus for directing lubricant onto the conveyor apparatus;

means on said lubricant direction means for contacting the conveyor apparatus;

engaging means separate from said lubricant direction means and adapted to be positioned adjacent the conveyor apparatus to be lubricated for engagement therewith;

pump means actuated by said engaging means for pumping lubricant through said lubricant direction means and onto the conveyor apparatus;

mounting means for pivotally mounting both said lubricant direction means and engaging means for simultaneous pivotal movement out of the path of the conveyor apparatus when necessary and in response to contact by the moving conveyor apparatus with said means on said lubricant direction means to avoid damage to either the conveyor apparatus or said lubrication apparatus;



base means for securing said lubrication apparatus to the conveyor apparatus;

said mounting means including first pivot means for pivotally mounting said engaging means to said lubricant direction means, and second pivot means for pivotally mounting said lubricant directing means to said base means, said first pivot means being spaced from said second pivot means; said second pivot means allowing said simultaneous pivotal movement of both said lubricant direction means and engaging means when said means on said lubricant direction means contact the moving conveyor apparatus.

4,506,764

LIFT TRUCK

Karl-Heinz Griesenbrock, Stuvenborn; Bernd David, Henstedt-Ulzburg, and Carsten Petersen, Bark, all of Fed. Rep. of Germany, assignors to Firma Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Oct. 22, 1981, Ser. No. 314,008

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 E **7 Claims**

1. In a lift truck comprising

a chassis having a central horizontally extending longitudinal axis,

a lifting frame including a lower portion which is carried by said chassis and vertically immovable relative thereto, said lifting frame comprising telescopic mast portions including uprights spaced apart in a predetermined horizontal direction extending transversely of the longitudinal axis, said lifting frame having a forward side and a rearward side,

an upwardly directed hydraulic lifting cylinder arrangement, which is disposed entirely on one side of said central longitudinal axis and includes an extensible piston rod,

a load carrier which is guided by said lifting frame and extends in said predetermined horizontal direction and is guided by said lifting frame to move along the same relative to said chassis,

reversing means carried by said lifting frame and extending above the lower end of said load carrier,

flexible tensile means having a first portion engaging said piston rod, a second portion trained around said reversing means, and a third portion depending from said reversing means to said load carrier and secured to the latter, said flexible tensile means being arranged to lift said load carrier relative to said chassis in response to an extension of said piston rod, and

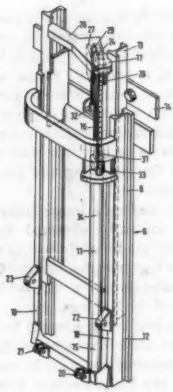
an operator's station which is provided on said chassis behind said lifting frame on the rearward side thereof and is laterally offset with respect to said central longitudinal axis so that each of said uprights defines a predetermined dead angle for the view of an operator located in said operator's station,

the improvement residing in that, in combination,

said lifting cylinder arrangement is disposed in one of said dead angles,

said tensile means are connected to said load carrier at the center of its extent in said predetermined horizontal direction between said uprights,

said reversing means comprise roller means which guide said tensile means so that in a top plan view said tensile means extends at an oblique angle to said horizontal direction,



said roller means are disposed a portion of said load carrier near the center of its extent in said predetermined horizontal direction and said lifting cylinder arrangement,

said roller means comprise a roller carrier, which extends at an oblique angle to said predetermined horizontal direction in the top plan view and two guide rollers rotatably mounted on said roller carrier for rotation on respective axes which include an oblique angle with respect to said longitudinal axis,

said flexible tensile means are trained over said guide rollers,

said piston rod is upwardly extensible,

said two rollers have apices at different elevations,

said reversing means includes a deflecting roller rotatably mounted at the top end of said piston rod, and

said flexible tensile means are trained around said deflecting roller.

4,506,765

PROXIMITY DETECTOR CIRCUITRY ESPECIALLY FOR LIFT DOORS

Reginald K. Payne, Stud Green Farm, Holyport, Maidenhead, Berkshire, and John Trett, Ranch House, Frieth, Henley-on-Thames, Oxfordshire, both of England

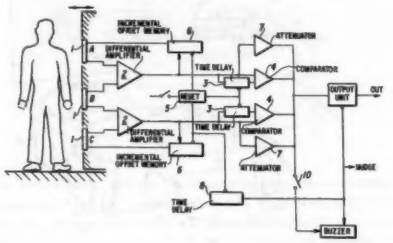
PCT No. PCT/GB82/00022, § 371 Date Sep. 16, 1982, § 102(e) Date Sep. 16, 1982, PCT Pub. No. WO82/02536, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 26, 1982, Ser. No. 420,246

Claims priority, application United Kingdom, Jan. 26, 1981, 8102324

Int. Cl.³ B66B *13/26*

U.S. Cl. 187—29 R **9 Claims**



1. Proximity detector circuitry for use in connection with door closure or analogous apparatus which comprises at least three sensors located at spaced intervals along the edge of a door, at least two of said sensors having control inputs for regulating outputs thereof, two differential amplifiers each of which is arranged to receive and compare the outputs of two of the sensors, each producing an error signal if there is a difference in output from the two sensors connected thereto, means for generating appropriate door control signals on the detection of an error signal, and means coupled to the control inputs for periodically adjusting said two sensors to approximate the outputs thereof to that of the third sensor.

4,506,766

METHOD AND APPARATUS FOR FAULT TIME OPERATING OF AN ELEVATOR

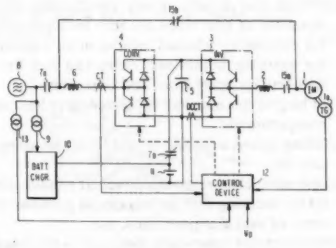
Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,700

Claims priority, application Japan, Aug. 17, 1983, 58-149922

Int. Cl.³ B66B *5/02*

U.S. Cl. 187—29 R **9 Claims**



1. A fault time operation device for an elevator motor (1) driven from an AC power source (8), said device comprising:

(a) first means (4) for converting AC power from the source into DC power, said first means also being operable in a reverse mode to convert DC power into AC power,

(b) second means (3) for converting DC power from the first converting means into AC power for the motor,

(c) an emergency battery (11),

(d) first switch means (7*a*) connected between an output of the power source and an input of the first converting means,

(e) second switch means (7*b*) connected between the battery and a junction between an output of the first converting means and an input of the second converting means,

(f) third switch means (15*a*) connected between an output of the second converting means and an input of the motor,

(g) fourth switch means (15*b*) connected between the input of the first converting means and the input of the motor,

(h) first means (CT) connected to the power source output for detecting a failure thereof,

(i) second means (DCCT) connected to said junction for detecting a failure of the second converting means, and

(j) control means (12) responsive to the first and second detecting means for:

(1) opening the first and fourth switch means and closing the second and third switch means in resonse to a power source failure detection to energize the motor from the battery through the second converting means, and

(3) opening the first and third switch means and closing the second and fourth switch means in response to a second converting means failure detection to energize the motor from the battery through the first converting means operating in a reverse mode.

4,506,767

PAD CLIP FOR DISC BRAKE

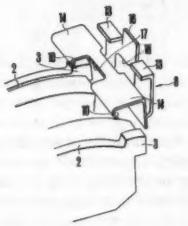
Takehisa Inoue, and Kazuhisa Kinoshita, both of Saitama, Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 487,594, Apr. 27, 1983, abandoned, which is a continuation of Ser. No. 218,120, Dec. 19, 1980, abandoned. This application Mar. 2, 1984, Ser. No. 585,016

Claims priority, application Japan, Dec. 21, 1979, 54-177276[U]

Int. Cl.³ F16D *55/224*

U.S. Cl. 188—73.38 **3 Claims**



1. A disc brake comprising:

a disc to be braked, said disc being rotatable about an axis;

a stationary support having a stepped part extending in the axial direction of the disc;

a pair of friction pads each located on an opposite side of the disc and relative to the axis of said disc having a radially inner side and a radially outer side, each friction pad has a pair of lug parts on the radially outer side thereof projecting generally in the radial direction of the disc outwardly from the disc axis with each said lug located at an opposite end of said friction pad in the circumferential direction of

the disc, and each of the lug parts has a generally radially extending inner side face facing the inner side face of the other lug part on said friction pad, each said lug part being engageable with the stepped part of said support for causing the pair of friction pads to be supported by the support in the axial direction of the disc;

means for supporting said pair of friction pads;

means for pushing said supporting means for the pair of friction pads for engaging said friction pads with the opposite sides of said disc; and

a pad clip located at each of the opposite ends of said friction pads spaced apart in the circumferential direction of said disc for elastically pushing the friction pads against said support, said pad clip including a first portion arranged to contact the support, a second portion spaced from and disposed angularly relative to said first portion and arranged to contact the lug part, and a hooked portion extending angularly from said second portion and arranged to contact the inner side face of the lug part for restricting the movement of the friction pad on the braking face of said disc during brake application.

4,506,768

BOOT ASSEMBLY

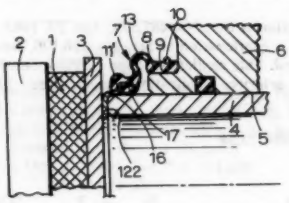
David B. Innocent, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 925,151, Jul. 17, 1978, abandoned. This application Sep. 12, 1980, Ser. No. 186,729

Claims priority, application United Kingdom, Jul. 20, 1977, 30526/77; Jan. 20, 1978, 2337/78

Int. Cl.³ F16D *65/16*

U.S. Cl. 188—370 **2 Claims**



1. A piston and cylinder assembly comprising a housing provided with a bore, a piston working in said bore and having a first end projecting from one end of said bore, and a boot assembly for preventing ingress of foreign matter into said one end of said bore, wherein said boot assembly comprises a plate, said plate comprising a portion of planar outline having an inner face forming an abutment face for said first end of said piston and in freely separable engagement therewith, an outer thrust transmitting face on the opposite side of said plate from said inner face, and an outer peripheral edge; an annular rim having a first portion integrally connected at one end with said peripheral edge, said first portion encircling said first end of said piston, said rim having a second portion integrally connected at one end to the other end of said first portion, said second portion being of greater diameter than said first portion and having its other end free; and a sealing boot comprising a first portion sealing against said housing adjacent to said one end of said bore by means of a clamping ring, a second portion sealingly and permanently connected to said second portion of said rim, and a flexible impermeable web connecting said first portion and said second portion of the boot.

4,506,769

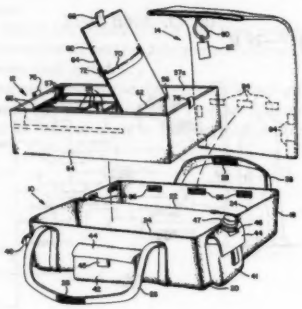
ACTIVITY BAG SYSTEM

Larry J. Franco; Jill Franco, both of 1812 Summer Cloud Dr., Thousand Oaks, Calif. 91362; Margaret K. Forino, and Costante Forino, both of 31942 Kings Park Ct., Westlake Village, Calif. 91316

Filed Sep. 28, 1982, Ser. No. 425,313

Int. Cl.³ A45C *3/00, 13/00*

U.S. Cl. 190—108 **1 Claim**



1. An activity bag system comprising in combination:

an outer flexible collapsible fabric carrying bag separable along closure means into upper and lower sections to divide the bag, respectively, into upper and lower inner storage compartments of substantially equal volume;

a pair of carrying straps attached to the lower section and extending upwardly from the opposite outer sides of said lower section over said upper section and adjustably joined by fastening means to provide alternatively a carrying handle and adjustable shoulder straps for carrying the outer bag as a back-pack;

securing means attached to the outer bag for securing articles to the outside of said bag;

multiple interchangeable self-supporting inner storage containers separate from and insertable alternatively one-at-a-time into said lower compartment of said outer, bag, each said container having substantially the same outer dimensions and shape and each sized to closely fit and substantially fill the lower compartment of said outer bag to shape and provide rigidity to a portion of the outer bag defining the lower compartment while enabling unrestricted access to the upper compartment, each said inner container comprising:

sidewalls and divider means partitioning said container inwardly of said sidewalls into multiple compartments for containing selected articles in an organized manner for carrying within said outer bag and for storage of said articles apart from said outer bag;

a lid hinged to a sidewall for covering at least some of said compartments,

securing means attached to said lid for securing articles to said lid,

cooperative closure means attached to said sidewalls and lid for securing said lid in a closed position over at least some of said compartments, and

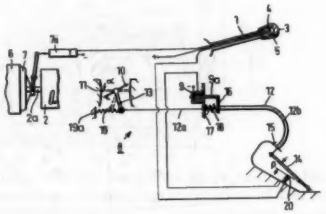
a partition means removably fastened to the interior of said outer bag to separate the upper and lower compartments for retaining items within the upper compartment, said partition means comprising a container storage bag sized and shaped to receive one of said inner containers for storage apart from said outer bag when said partition is removed from the interior of said bag.

4,506,770

AUTOMATIC MOTOR AND CLUTCH CONTROLS

Christoph Schmid, Bühl, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,622
Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118853
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—0.08 17 Claims



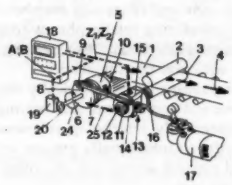
1. In an automotive vehicle having an engine and a change-speed transmission, the combination of a gear-shift which is actuatable to change the ratio of the transmission; a clutch interposed between the engine and the transmission; regulating means for disengaging said clutch in response to actuation of said gear-shift so that the engine is disconnected from the transmission while the gear-shift is actuated and for reengaging said clutch when the actuation of the gear-shift is terminated; adjustable means for supplying fuel to the engine; first adjusting means for adjusting said supplying means so as to reduce the rate of fuel admission to the engine in response to and during actuation of said gear-shift; second adjusting means for said fuel supplying means, said second adjusting means comprising a member which is movable between a plurality of positions; and means for establishing an operative connection between said gear-shift and said first adjusting means only within a certain range of said plurality of positions of said member.

4,506,771

METHOD AND APPARATUS FOR OPERATING CLUTCH AND BRAKE CONTROL DEVICE OF MACHINES HAVING INTERMITTENT, UNDIRECTIONAL OPERATION

Egon Krogh, Sonderborg, and Knud Blohm, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jul. 26, 1982, Ser. No. 402,122
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131675
Int. Cl.³ B60K *41/28, 41/24;* F16H *29/20*
U.S. Cl. 192—12 R 7 Claims



1. A method for periodically operating a switching device of a clutch having an inherent fixed reaction time (t1) so as to be effective at a predetermined point (x) in periods of varying time, comprising the steps,

providing variable speed rotating means operable with periods of varying time,

generating from said rotating means a reference signal (A) and an actuating signal (B) during each of said periods wherein said actuating signal (B) has an arbitrary fixed angular displacement (α) leading said predetermined point (x) and a fixed angular displacement (α) of the same magnitude trailing said reference signal (A),

providing a reference time increment (t2) equal to said reaction time (t1),

utilizing said reference signal (A) in conjunction with said reference time increment (t2) to generate a first signal time (C) which trails said reference signal (A) by said time increment (t2),

utilizing said first signal time (C) to initiate a first counting interval (Δt),

utilizing said actuating signal (B) to stop said first counting interval (Δt) and initiate a second counting interval (ta),

utilizing the end of said first counting interval (Δt) to make the length of said second counting interval (ta) equal thereto,

utilizing the end of said second counting interval (ta) to generate an actuation time (D),

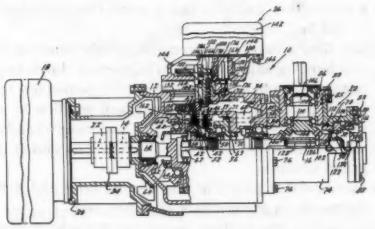
and utilizing said actuation time (D) to generate a signal for operating said switching device.

4,506,772

MODULAR ACCESORIES FOR CLUTCH/BRAKE UNIT

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed Jul. 30, 1982, Ser. No. 403,299
Int. Cl.³ F16D *67/04;* B60K *17/28, 41/24*
U.S. Cl. 192—18 A 11 Claims



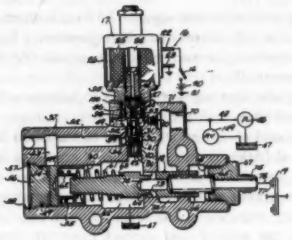
1. In an oil submerged clutch/brake unit having an exterior housing with an interior chamber, a drive element, torque retarding means, and torque transmission means including a driven element, a modular system for modifying the torque transmission means of the unit comprising a drive motor attached to said drive element, first and second accessories removably integrated with said unit by attachment means for each of said first and second accessories, and at least two stations on said unit including means for mounting one of said accessories to said housing at each said station and means for permitting access of each said one accessory at each said station to at least communicate with the interior chamber of said housing, wherein said system further includes means for actuating each said accessory to modify the torque transmission means of the clutch/brake unit by selectively acting directly in association with one of said drive element or said driven element.

4,506,773

ELECTRICALLY CONTROLLED HYDRAULIC CLUTCH FOR A FRONT WHEEL DRIVE

Robert E. Schott, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 31, 1983, Ser. No. 462,398
Int. Cl.[3] F16D *25/063, 29/00*; B60K *41/00*
U.S. Cl. 192—52 7 Claims



1. In a tractor having front wheels, rear wheels, an engine and drive means connecting the engine to the front and rear wheels, a front wheel drive system comprising:

a hydraulically actuated clutch including a hydraulic actuator operative to engage said clutch when it is supplied pressurized fluid, said clutch being disengaged when pressurized fluid is exhausted from said actuator,

a reservoir,

a pump connected in fluid receiving relation to said reservoir,

a clutch control valve including

a housing having

an input port connected in fluid receiving relation to said pump,

a clutch port connected in fluid delivery relation to said hydraulic actuator of said clutch,

a sump chamber connected to said reservoir,

a first cylindrical bore and a second bore aligned with said first bore,

a fluid flow control spool reciprocatively mounted in said first bore for axial movement between a clutch engaged position in which said input port is connected to said clutch port and a clutch disengaged position in which said clutch port is connected to said sump chamber,

spring means biasing said spool toward its clutch disengaged position,

an accumulator piston in said second bore and defining therewith an accumulator chamber, and

axial thrust transmitting means operatively interposed between said accumulator piston on said control spool, and

a pilot hydraulic circuit operable to selectively connect said pump with said accumulator chamber including

a solenoid pilot valve having a fluid connection to said reservoir, said solenoid pilot valve including a pilot valve element shiftable between a clutch engaging position in which said pump is connected in fluid delivery relation to said accumulator chamber and a clutch disengaging position in which the accumulator chamber is connected to said reservoir, and

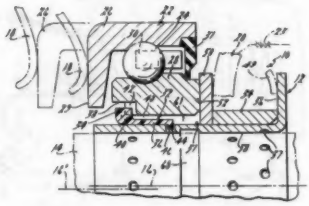
a fluid flow restrictor in said circuit, said restrictor and accumulator chamber being proportioned in relation to said spool to effect relatively slow movement of the latter from its clutch disengaged position to its clutch engaged position when said pilot valve element is moved to its clutch engaging position whereby a gradual pressure rise in said clutch actuator is effected.

4,506,774

SPRINGLESS SELF-ALIGNING CLUTCH RELEASE BEARING ASSEMBLY

Dennis A. Block, Northville, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Nov. 13, 1981, Ser. No. 321,010
Int. Cl.[3] F16D *23/14*
U.S. Cl. 192—98 10 Claims



1. An improved self-aligning clutch release bearing assembly for a friction clutch in a vehicle power train having release lever means rotatable about an input shaft axis of said clutch, a guide member disposed generally coaxially around a transmission shaft axis of said power train and actuating fork means, said bearing assembly comprising:

a tubular bearing carrier slidably mounted on said guide member for reciprocable, translational movement therealong in response to actuation of said actuating fork means;

a bearing including a plurality of anti-friction elements interposed between radially spaced inner and outer race members, one of said race members being adapted for rotation and having an annular radially extending bearing surface for engaging said clutch release lever means;

said bearing being disposed substantially coaxially around said bearing carrier between said release lever means and said actuating fork means and formed to allow for a predetermined radial clearance for said bearing for permitting said bearing to shift radially with respect to said bearing carrier, so that said bearing may coaxially align itself with said clutch input axis under a dynamic force exerted on said bearing by said release lever means;

a resilient retainer sleeve having an axially-extending portion thereof interposed radially between the other of said bearing race members and said bearing carrier; confronting surfaces of said bearing and said retainer sleeve being formed to define said predetermined radial clearance between said bearing and said retainer sleeve;

radial projecting means for mechanically interlocking said retainer sleeve and said other race member of said bearing in an axially interfering relationship with one another in order to substantially retain said bearing in assembled relationship with said bearing carrier;

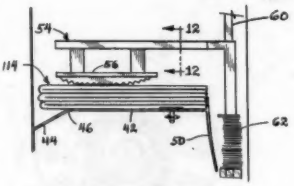
first cooperating means for mechanically interlocking said retainer sleeve and said other of said bearing race member in a circumferentially interfering relationship with one another in order to substantially prevent relative rotation between said retainer sleeve and said other race member of said bearing; and

second cooperating means for mechanically interlocking said retainer sleeve and said bearing carrier in a circumferentially interfering relationship with one another in order to substantially prevent relative rotation between said retainer sleeve and said bearing carrier.

4,506,775
NEWSPAPER VENDING MACHINE

Melanie C. LeBron, and Renard L. LeBron, both of 8008 Harney, Omaha, Nebr. 68114

Filed Jun. 16, 1982, Ser. No. 389,014
Int. Cl.[3] G07F *11/16*
U.S. Cl. 194—26 4 Claims

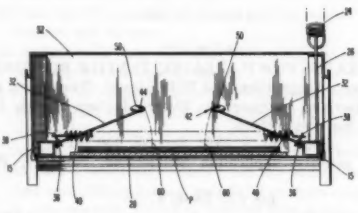


1. A vending machine for newspapers and the like, said machine comprising a housing for the storage of said newspapers, a support in said housing for supporting said newspapers, feeding means for moving a newspaper off said support, said feeding means comprising a newspaper gripping and feeding member overlying a top surface of said newspaper and means for rotating said gripping member through a delivery cycle comprising a forward movement to engage the top surface and move said newspaper off said support to a delivery means in said housing and a rearward movement to the start of the next delivery cycle, said gripping and feeding member being provided with a serrated member and said forward movement being effected in the direction of said serrations, said serrations being in the form of a series of laterally extending teeth supported on a stiff base, said base being adapted to flex slightly to increase a grip-like bite into the top surface of a top-most newspaper engageable by said feeding and gripping member and said teeth being engageable with the top surface of the newspaper at a slightly downward angle pointed in the direction of forward movement, said base being slightly bowed downwardly and adapted to flex slightly toward a flattened position when the gripping and feeding member rests upon the newspaper.

4,506,776
NEWSPAPER DISPLAY MACHINE

Ronald C. Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed Sep. 9, 1983, Ser. No. 530,787
Int. Cl.[3] G07F *5/00*
U.S. Cl. 194—54 16 Claims



1. A newspaper display machine comprising:

a container for housing a supply of newspapers,

an access door pivotably mounted at a front side of said container for rotation between open and closed positions about a generally horizontal axis disposed along a lower edge of said door,

said door including a transparent window having a height and width substantially commensurate with the full height and full width dimensions of newspapers being sold from said machine,

means on said container and door for locking said door to said container in said closed position of said door, and for unlocking said door in response to the depositing of preselected coinage,

first closure spring means for biasing said door toward its closed position,

at least one pressure plate mounted on an inner side of said door for swinging movement toward and away from said window between closed and open positions, respectively,

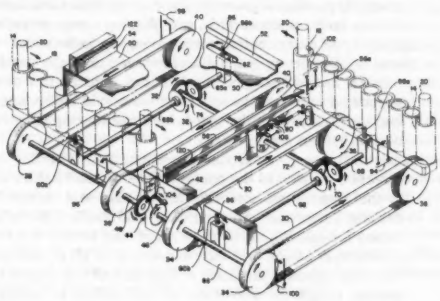
second closure spring means for biasing said pressure plate toward its closed position to press a full-length display newspaper against an interior surface of said window, and

retaining means on said container for engaging said plate when said plate and door are both in their open positions, to releasably retain said door and plate in their open positions against the closing biases of said first and second spring means.

4,506,777
SAMPLE HANDLING APPARATUS

Richard S. Kampf, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 965,962, Dec. 4, 1978, abandoned, which is a continuation of Ser. No. 754,815, Dec. 27, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 72,714
Int. Cl.[3] B65G *43/00*
U.S. Cl. 198—341 23 Claims



1. Apparatus for circulating sample holders along a rectilinear path past an operating station in a sample holder storage compartment comprising:

first and second substantially parallel continuous conveyor means on opposite sides of saidoperating station for engaging and driving sample holders positioned thereon in first and second opposite directions toward and away from said station;

first and second means adjacent opposite ends of said first and second conveyor means for halting motion of sample holders in said first and second directions respectively to define first and second longitudinal stop positions for each holder; and

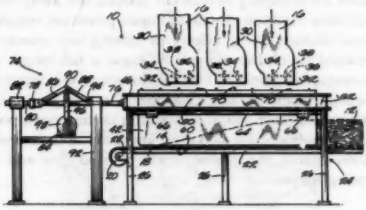
first and second lateral drive means for engaging each sample holder in said first and second longitudinal stop positions and for laterally moving said holders between said first and second conveyor means, said first lateral drive means laterally moving its associated sample holder into and then away from an operative position adjacent said station.

4,506,778

FLAKE ALIGNER INCLUDING RECIPROCATING BAFFLES

Tauno B. Kilpela, Atlantic Mine, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Jun. 1, 1982, Ser. No. 383,828
Int. Cl.³ B65G 47/24
U.S. Cl. 198—382 5 Claims



1. Apparatus for forming a loosely felted mat of elongated wood flakes, the mat having a longitudinal direction, and the wood flakes being aligned in parallel relation and parallel to the longitudinal direction of the mat, said apparatus comprising,

means defining a support surface for supporting the loosely felted mat of wood flakes;

means positioned above said support surface and for depositing wood flakes on said support surface in a uniformly dispersed, loosely felted relation; and

means between said support surface and said depositing means and for aligning said elongated wood flakes in mutually parallel alignment as said wood flakes are deposited on said support surface, said aligning means including

a plurality of planar baffles each having opposite ends,

means for supporting said baffles in spaced mutually parallel relation and defining vertical planes, said baffles being supported such that the spaces between said baffles at one end are greater than the spaces between the opposite ends of said baffles, and

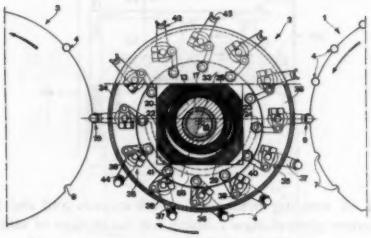
means for causing reciprocal movement of said baffles in a direction parallel to the planes defined by said baffles and in the longitudinal direction of the mat, said means for causing reciprocal movement of said baffles including means for causing moveent of all of said baffles in a first direction in unison and then movement of all of said baffles in an opposite direction in unison, and said means for causing reciprocal movement of said baffles including a first rigid arm having opposite ends and a second rigid arm having opposite ends, means for pivotally joining one end of said first rigid arm to one end of said second rigid arm, means for pivotably connecting said one end of said first rigid arm and said one end of said second rigid arm to the periphery of a disc, said disc being supported for rotation about a horizontal axis transverse to said longitudinal direction, said means for connecting including a vertically extending third rigid arm having one end pivotally connected to said one end of said first rigid arm, and said third rigid arm having an opposite end pivotally connected to said disc in spaced relation from said horizontal axis whereby rotation of said disc causes vertical reciprocal movement of said third rigid arm and vertical reciprocal movement of said one end of said first rigid arm and said one end of said second rigid arm, means for rotatably driving said disc, means for pivotally connecting an opposite end of said first rigid arm to a fixed member, and means for connecting an opposite end of said second arm to said baffles to cause reciprocal movement of said baffles in response to rotation of said disc about said horizontal axis.

4,506,779

DEVICE FOR TRANSFERRING BAR SHAPED ARTICLES

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Società per Azioni, Bologna, Italy

Continuation of Ser. No. 307,935, Oct. 2, 1981, abandoned. This application Jun. 12, 1984, Ser. No. 619,409
Claims priority, application Italy, Dec. 12, 1980, 50353 A/80
Int. Cl.³ B65G 47/31
U.S. Cl. 198—461 3 Claims



1. A device for transferring bar shaped articles while moving perpendicular to their longitudinal axes between two conveyors each provided with equally spaced suction housings for retaining the articles with the spacing in each conveyor being different from the other, comprising: a link-up conveyor positioned between said two conveyors, said link-up conveyor comprising:

a first rotating element supported by a fixed sleeve and carrying a plurality of two arm pivoted cranks, one arm of each crank being provided with a suction housing for picking up an article from one of said two conveyors and delivering it to the other;

a second rotating element mounted on a driven shaft which passes through said sleeve and rotates on an axis spaced from and parallel to the rotational axis of said first rotating element;

a gearwheel in meshing engagement with both of said elements, said gearwheel being supported by said sleeve and rotatable on an axis spaced from and parallel to said axes of said elements; and

the other arm of each of said cranks being linked peripherally to said second rotating element so that said cranks oscillate with respect to said first rotating element during the movement of a said crank housing from a pick-up position to a delivery position and back to a pick-up position so as to match the crank housing positions and speeds, at pick-up and delivery positions, with the corresponding positions and speeds of said housings of said two conveyors.

4,506,780

APPARATUS FOR HANDLING TEXTILE BOBBINS

Peter Novak, Taegerwilen, and Willi Moertl, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

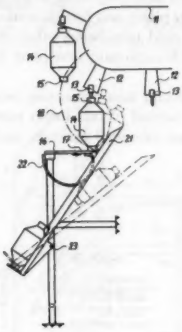
Filed Nov. 9, 1982, Ser. No. 440,281
Claims priority, application Switzerland, Nov. 29, 1981, 7599/81
Int. Cl.³ B65G 47/34
U.S. Cl. 198—483 11 Claims

1. In combination

a conveying means having a plurality of spaced apart pins for engaging and conveying bobbins in a suspended manner through a predetermined path having an upper run and a lower run, each said pin being adapted to release an engaged bobbin therefrom upon pushing of the bobbin onto said pin; and

a support member located in said path at a release position between said upper run and said lower run for abutting a

free end of each successive bobbin to cause each bobbin moving from said upper run to said lower run to move



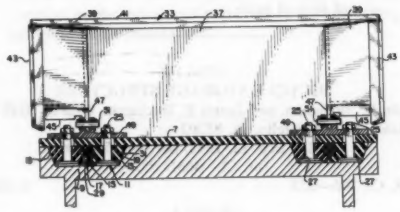
towards said respective pin for release of the bobbin from engagement with said respective pin.

4,506,781

SELF TRAINING BELT CONVEYOR WITH DIGGING ELEMENTS

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jun. 7, 1983, Ser. No. 501,836
Int. Cl.³ B65G *17/36*
U.S. Cl. 198—711 **21 Claims**



1. A belt conveyor comprising:

an endless belt having digging means protruding from the outer surface thereof at spaced locations along its length;

a frame including a pair of spaced pulleys around which said endless belt rotates;

an endless wire rope extending throughout its length inside the loop of said endless belt;

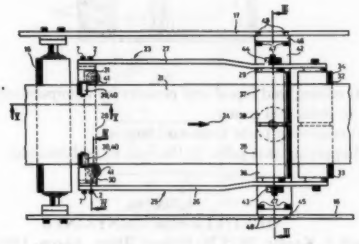
a resilient rail member secured to the inner surface of said endless belt and having a longitudinal bore therethrough in which is loosely received the wire rope throughout its length, the side edges of said rail member being tapered inward toward each other from the endless belt inward, and said pulleys having peripheral grooves therein having a cross-section, including tapered side walls, corresponding to, but slightly smaller in width than, that of said resilient rail member for receiving the same so that as said endless belt, resilient rail member and endless wire rope pass around said pulleys together, said resilient rail member is wedged down into the pulley groove to tightly grip said wire rope which, in turn, resists any forces tending to cause the belt to creep axially along the pulleys and resists digging forces generated by the digging means which tend to cause the belt to pull radially away from the pulleys.

4,506,782

DEVICE FOR LONGITUDINALLY GUIDING AN ENDLESS WEB

Yves Jeanneret, Grandvaux, and Jean-Louis Wenger, Puidoux, both of Switzerland, assignors to Bobst SA, Lausanne, Switzerland

Filed May 24, 1983, Ser. No. 497,413
Claims priority, application Switzerland, Jun. 2, 1982, 3375/82
Int. Cl.³ B65G *39/16*
U.S. Cl. 198—806 **3 Claims**



1. A device for longitudinally guiding an endless web, said web being disposed in a conveyor frame having at least one cross plate, said device comprising a subframe having a pair of side members with a cross-member spaced inward of one end, each side member at said other end having a bearing housing with a pair of pressure rollers for engaging opposite surfaces of the web and a lateral guiding roller mounted on an axis perpendicular to the axis of the pressure rollers; first roll means mounted above the cross-member for engaging an upper surface of the web; second roll means mounted at said one end for engaging the lower surface of the web, each of said first and second roll means having an axle extending between the side members of the subframe with a pair of rollers which are mounted thereon for independent rotation and have a width approximately one-half the distance between the side members; and pivot means for mounting the subframe on the cross plate of the conveyor frame for rotation about a pivot axis disposed on the theoretical center line of the endless web and passing through the center of the theoretical axis of the first roll means, said pivot means including a bearing arrangement between said cross-member and cross plate and a pair of rollers mounted on the subframe at the cross-member for engaging the cross plate so that the endless web is pressed between the pressure rollers before it passes underneath the rollers of the first roll means and over the rollers of the second roll means.

4,506,783

HAIR BLEACHING ART

Shila Morganroth, 1225 Waterbury Rd., Highland, Mich. 48031

Continuation of Ser. No. 688,595, Jul. 9, 1976, abandoned, which is a division of Ser. No. 579,012, May 9, 1975, Pat. No. 4,114,632, and a continuation-in-part of Ser. No. 481,695, Jun. 14, 1974, Pat. No. 4,209,207. This application Dec. 17, 1979, Ser. No. 104,106
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.
Int. Cl.³ B65D *35/44*
U.S. Cl. 206—581 **1 Claim**

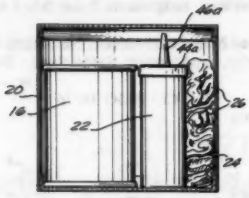
1. In the art of bleaching hair with a viscous mixture of liquid developer and finely powdered, duating, obnoxious powder, the improvement which comprises

(a) producing a package by

(i) enclosing the quantity of said hair bleaching powder required for a single hair bleaching operation in a dustproof, moisture-resistant, thin-walled, flexible plastic bag and

(ii) enclosing said bag in a moisture-proof container;

(b) removing said bag from said container;
(c) introducing liquid into said powder within said bag in proper quantity to form a paste of desired viscosity;



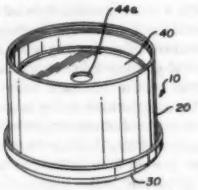
(d) mixing said liquid and powder by manipulating said bag to form said paste;
(e) removing paste from said bag; and
(f) applying said paste to the hair to be bleached.

4,506,784

MULTIPLE-USE CONTAINER

Joseph S. Kanfer, 2825 N. Walnut Ridge, Akron, Ohio 44313

Filed Feb. 21, 1984, Ser. No. 581,911
Int. Cl.[3] B65D *83/00, 47/36*
U.S. Cl. 206—77.1 **1 Claim**



1. A free-standing, multiple-use container, comprising:
(A) an elongate body;
(B) a removable lid receivable on one end of said body; and
(C) an integral bottom panel normally closing off the opposed end of said body and including
(1) a centrally disposed score line defining a relatively small removable access disc; and
(2) a concentric score line spaced closely inwardly from the periphery of said bottom panel defining a dispensing member upon removal of said access disc whereby said container may be used as a dip can with said lid removed and said bottom panel intact and as a self-dispensing container with said bottom panel severed and said access disc removed for dispensing material through the opening thus formed upon pressure being applied to the bottom member when severed.

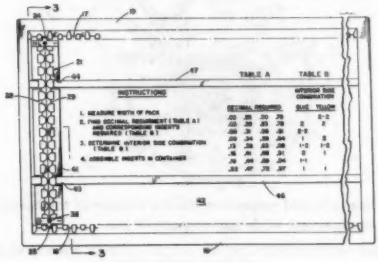
4,506,785

UNIVERSAL CIRCUIT PACK CONTAINER

Roger L. Seefeldt, Oklahoma City, Okla., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,190
Int. Cl.[3] B65D *85/30*
U.S. Cl. 206—334 **9 Claims**

1. A container for receiving printed circuit boards, which comprises:
a box having a pair of opposed parallel side walls, said side walls having parallel evenly spaced grooves, the grooves on one wall being laterally aligned with the grooves on the other wall;
a pair of insert plates, each of said plates having slots formed on opposite sides that extend the entire lengths of said plates, said slots being of uniform depth and width;
a pair of first tabs projecting from opposite ends of a first of said insert plates and fittable within a pair of said side wall grooves; said tabs being offset from a center line plane running through said first plate by a first predetermined amount;
a pair of second tabs projecting from opposite ends of the other or second of said insert plates and fittable within a pair of said side wall grooves; said tabs being offset from



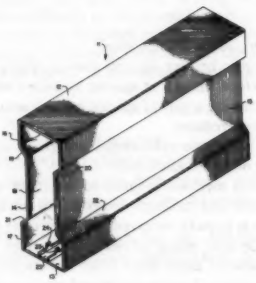
a center line plane running through said second plate by a second predetermined amount which is the same or different from said first predetermined amount;
said first insert plate having a color marking indicative of the amount of offset of said pair of insert tabs on said first insert plate; and
said second insert plate having a color marking wherein the color is distinguishable from the marking on the first plate to indicate the amount of offset of said pair of insert tabs on said second plate.

4,506,786

BICYCLE STORAGE STRUCTURE

Alvin E. Buchanan, and James E. Buchanan, both of 5049 Whitaker Rd., Pocatello, Id. 83202

Filed Sep. 12, 1983, Ser. No. 530,909
Int. Cl.[3] B65D *85/68*
U.S. Cl. 206—335 **6 Claims**



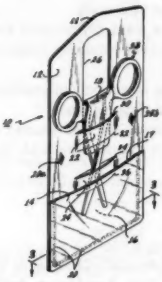
1. A bicycle storage structure which includes an elongated housing having an opening at one end, said housing having a width and height to accommodate a bicycle therein, and including a top and bottom joined by spaced side panels, and means protruding into the interior of the housing to prevent turning of the bicycle pedals, said means extending longitudinally of the housing and affixed to at least one side panel to protrude inwardly therefrom to overlie at least one pedal and prevent turning thereof.

4,506,787

INSTRUMENT PROTECTOR

Loran H. Bruso, Ontario, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 27, 1983, Ser. No. 517,553
Int. Cl.[3] B65D *73/00, 85/00, 65/24;* A61B *17/06*
U.S. Cl. 206—363 5 Claims



1. A sterilizable device for protecting a jointed medical instrument which comprises:

a semi-rigid support member formed with an integral strap for holding the removable instrument on said support member;

a flap formed by partial severance of said support member and being positioned for folding between the parted handles of said jointed instrument and under said integral strap to keep the handles and their associated tips in a separated condition; and

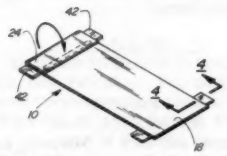
a sheet overlying a portion of said support member and joined thereto at the margin of said support member to form an open-ended pocket thereover for protecting the instrument tips therein.

4,506,788

MAGNETIC CASSETTE FOR RADIOGRAPHIC FILM MATERIAL

Donald Dallas, 641 Grovewood Dr., Gretna, La. 70053

Filed Aug. 10, 1983, Ser. No. 521,689
Int. Cl.[3] B65D *85/38, 81/30, 65/16;* G03B *11/00*
U.S. Cl. 206—455 7 Claims



1. A cassette for housing radiographic film, comprising:

a. an envelope portion open-ended at a first end, having top and bottom portions defining an x-ray film receiving space therebetween;

b. means for closing said open-ended first end for disallowing light therewithin; and

c. magnetic means comprising a plurality of individual magnet members situated along the length of said envelope for uniformly adhering said envelope to the surface to be x-rayed.

4,506,789

CHILD RESISTANT PACKAGE

Jeffrey Dlugosz, Philadelphia, Pa., assignor to Packaging Coordinators, Inc., Philadelphia, Pa.

Filed Jun. 30, 1983, Ser. No. 509,360
Int. Cl.[3] B65D *83/04, 85/56*
U.S. Cl. 206—532 4 Claims

1. A child-resistant package including a unitary plastic sheet having at least two blisters projecting from one face thereof, and having openings into said blisters in the opposite face thereof, said blisters being linearly aligned in a first direction and including medicaments therein, a unitary, rupturable backing strip adhered to said opposite face of the plastic sheet and sealing the openings into the blisters, a front paperboard sheet overlying and engaging said one face of the unitary plastic strip and including openings therethrough into which the blisters extend, a back paperboard sheet overlying and engaging the rupturable backing strip and being adhered to the front sheet in regions surrounding said sealed blisters, said back sheet including a separable tear strip means overlying each blister, each tear strip means being movable in a linear direction substantially perpendicular to the direction of linear alignment of the blisters, said tear strip means including leading ends located inwardly of a common marginal edge of the package, each leading end being adapted to be gripped, when exposed, for permitting easy removal of said tear strip means from surrounding regions of the back sheet to expose the rupturable backing strip in the region overlying the opening into an associated blister, each of said leading ends being normally unexposed by being covered with a bendable tab section defined by lines of perforations along which the bendable tab section can be separated for exposing the leading end of an associated tear strip means, said plastic sheet and rupturable backing strip being partially located in the region of the bendable tab sections and being relieved so as not to be present in regions aligned with lines or perforations along which the bendable tab sections are adapted to be separated.

4,506,790

MERCHANDISE SUPPORT

Raymond F. Muscari, Lilburn, Ga., assignor to International Beverage Supply, Inc., Atlanta, Ga.

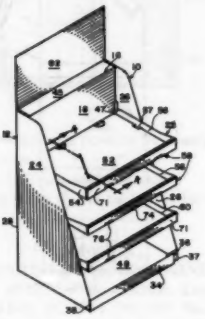
Continuation of Ser. No. 184,396, Sep. 5, 1980,. This application Jun. 6, 1983, Ser. No. 500,794
Int. Cl.[3] A47F *5/11*
U.S. Cl. 211—59.4 29 Claims

1. In a merchandise support which may be constructed from corrugated material:

a normally vertical shelf support for supporting a plurality of shelves and a plurality of normally horizontal vertically spaced shelf slots on said vertical support, said slots being of a length across the width of said support to accommo-

date at least part of one end of the shelf inserted therethrough,

a plurality of movable merchandise support shelves for selective assembly on said support in a respective selected slot therein, each of said shelves being movable along a fold line at said slot from a substantially horizontal position upwardly to a raised position to expose merchandise and comprising a shelf bottom, front and rear ends and a movable shelf retaining member on the rear end of the said



shelf inserted through said slot to extend behind said support, each shelf being supported by the merchandise, such as bottles, therebelow and the lowermost merchandise being supported on the floor whereby as the merchandise is removed completely from each shelf that shelf may be inclined upwardly and thereby moved to expose the merchandise on the shelf therebelow which merchandise is resting on the merchandise beneath it so that the support for the shelves is by means of the merchandise resting on the floor or ground surface.

4,506,791

SHIP'S DERRICK

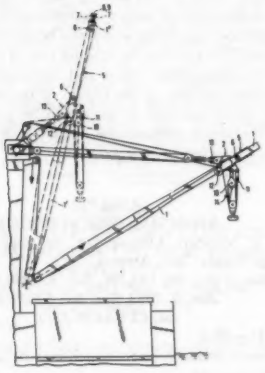
Michael Brösigke, Hamburg, Fed. Rep. of Germany, assignor to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,633

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232489

Int. Cl.³ B66C *1/00*

U.S. Cl. 212—190 **5 Claims**



1. A ship's derrick which can be swiveled and tripped up by means of a bearing and one or more topping lift tackles and whose loading tackle is directly attached to a crab which can be moved in the derrick's longitudinal direction by means of a tackle line, characterized in that in a heavy cargo derrick,

the tackle line between a tubular portion of the derrick brace and the crab comprises a multi-part tackle which is dimensioned generally similar to the load tackle and which is provided with two hauling parts, the arrangement being such that the topping lift tackles act on the crab,

a derrick head fitting secured to said tube in spaced relationship with respect to said crab,

a first series o sheaves rotatably secured to said crab,

a second series of sheaves rotatably secured to said derrick head fitting,

said tackle lines being in supported contacting relationship with respect to said sheaves, and

said first series of sheaves and said second series of sheaves each having sheaves disposed on both sides of said tube.

4,506,792

ARTICULATED WAIST TERRAIN VEHICLE

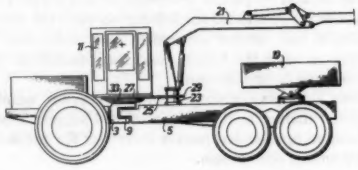
Bo P. S. Hedlund, and Erik Arnoldsson, both of Söderhamn, Sweden, assignors to Kockums Industri AB, Soderhamn, Sweden

Filed Mar. 5, 1982, Ser. No. 354,958

Claims priority, application Sweden, Mar. 13, 1981, 8101626

Int. Cl.³ B66C *23/36*

U.S. Cl. 212—223 **3 Claims**



1. An articulated waist terrain vehicle with a chassis and a driver's cab and at least one work implement mounted on said chassis, said chassis comprising a wheeled forward section and a wheeled rear section and an intermediate section mounted between and supported only be said forward and rear sections, and connected to the forward section by means of a substantially horizontal articulating shaft extending in the vehicle travelling direction, and connected to the rear section by means of a substantially vertical articulating pin; the cab being mounted on said intermediate section so that it is fixed in longitudinal orientation in relation to the forward section when the vehicle is travelling in the forward direction to accompany the forward section in the essentially longitudinal steering movements thereof.

4,506,793

BREAKABLE VIAL

David C. MacGregor, and Gary S. Margules, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Aug. 1, 1983, Ser. No. 519,202

Int. Cl.³ B65D *17/32*

U.S. Cl. 215—32 **28 Claims**

1. A hollow, breakable, sealed vial having upper and lower portions separated by a weakened region to facilitate the breaking of the vial at said weakened region, the improvement therein comprising:

flexible sleeve means surrounding said upper and lower portions of said vial adjacent to and covering said weakened region, a part of said sleeve means being deformable

toward the longitudinal axis of the vial when the vial is broken and the upper portion is removed, said flexible

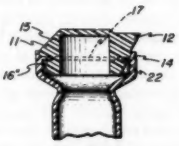
sleeve means being constructed to remain so deformed to cover the broken edge of said upper portion of the vial.

4,506,794

CHILD PROOF SAFETY CLOSURE COMBINATION OF THE TURN AND LIFT PLUG TYPE

Frank Wilson, Newmarket, Canada, assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 27, 1983, Ser. No. 488,943
Int. Cl.³ B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—206 **18 Claims**



1. A child proof closure/container combination comprising:

A. a bottle having an upstanding annular rim above the neck thereof, said annular rim being provided with flange means arranged around the inner periphery, and at a level downward from the edge, thereof; and

B. a closure plug for insertion within said upstanding annular rim so as to thereby leave only the upper portion of said plug exposed above the edge of said annular rim, said plug having an annular groove therein for engagement with said flange means,

said container and plug being provided with cooperating release means, whereby said plug is removable by upward force thereagainst, from said container only when said cooperating release means are in radial alignment with one another.

4,506,795

TAMPER-EVIDENT CLOSURE

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Feb. 18, 1983, Ser. No. 467,873
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **13 Claims**

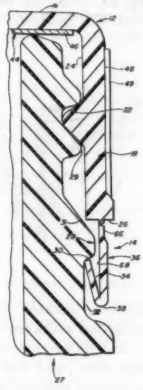
1. A tamper-evident closure for sealing an open-topped container having an external screw thread formed and an outwardly projecting annular shoulder formed below the screw thread, the closure comprising:

an internally threaded cap which may be removed from the container for dispensing the contents of the container,

the cap comprising a top wall for extending across the open top of the container, an annular sidewall integrally joined to the top wall about the periphery of the top wall and depending therefrom, and an internal screw thread formed on the inside of the sidewall for engagement with the external screw thread on the container, and

tamper-indicating means comprising a ring depending from the annular sidewall, said ring including an upper portion of substantially reduced cross sectional thickness and a lower portion of thicker cross section,

each of said upper and lower portions being located axially in vertical alignment with said sidewall and radially within the confines of the skirt so that downward forces during a capping operation do not separate the ring from



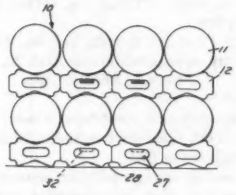
the cap, said upper portion defining therein a circumferential groove for locating a cutting operation, a cut section of reduced cross section within said groove to form breakable connections for detachably securing the ring to the sidewall, and a plurality of tabs bent upward and radially inward from the ring for engaging the annular shoulder of the container during removal of the cap to prevent the tamper-indicating means from traveling upward beyond the annular shoulder with the cap and to break the ring away from the cap.

4,506,796

DRUM STACKING RACK

Larry J. Thompson, Pembroke Pines, Fla., assignor to Equipment Company of America, Hialeah, Fla.

Filed Mar. 2, 1983, Ser. No. 471,276
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—59.4 **10 Claims**



1. A drum storage rack formed by assembling a plurality of modules together in a laterally abutting arrangement, wherein each of said modules comprises:

first and second end plates having a central axis interconnected by at least one elongated support member;

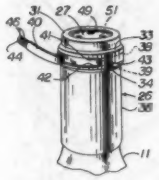
each of said end plates having a top portion and a bottom portion adapted to receive a drum, with an aperture formed therebetween for receiving a lifting means, and side portions each having an outwardly extending, rectangular lift extension;

said lift extension being shorter in length than said side portion and adapted to be attached to a similar lift extension on a laterally adjacent module forming a flat walled pocket for receiving a lifting means parallel to said central axis.

4,506,797
WINE BOTTLE COVER

Joseph J. Bullock, III, Atherton, Calif., assignor to Three Sisters Ranch Enterprises, San Jose, Calif.

Filed Sep. 19, 1983, Ser. No. 533,249
Int. Cl.³ B65D *41/32*
U.S. Cl. 215—256 **8 Claims**



1. A wine bottle overcap formed of a thin-walled plastic material comprising a top disk and a peripheral skirt depending from said disk formed with an external first bead having parallel top and bottom bead edges, said first bead being shaped to conform tightly to the second external bead of a conventional wine bottle neck, an upper score-line extending substantially circumferentially around said first bead spaced below said top bead edge, a lower score-line parallel to said first score-line extending substantially around said first bead spaced above said bottom bead edge, said score-lines defining a tear strip positioned intermediate said top and bottom bead edges, a top groove in said first bead comprising an extension of said upper score-line, a bottom groove in said first bead comprising an extension of said lower scoreline and a third groove in said first bead joining ends of said upper and lower grooves, said upper, lower and third grooves comprising a tear tab, whereby upon pulling said tear tab outward and away from said skirt, said skirt is torn away around said first bead.

4,506,798
CONTAINER

Maurice Goutille, Lamorlaye, France, assignor to SCC Six-In-One Containers Co., S.A., Geneva, Switzerland

PCT No. PCT/CH82/00086, § 371 Date Mar. 16, 1983, § 102(e) Date Mar. 16, 1983, PCT Pub. No. WO83/00317, PCT Pub. Date Feb. 3, 1983
PCT Filed Jul. 9, 1982, Ser. No. 476,870
Claims priority, application France, Jul. 20, 1981, 81 14107
Int. Cl.³ B65D *87/00*
U.S. Cl. 220—1.5 **11 Claims**

1. A shipping container comprising a base, two side panels, a front panel, a back side which includes at least one door, and a roof, characterized in that

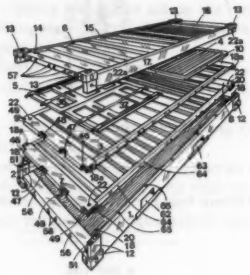
(a) the preceding components are separable for selective interconnection into an assembled unit, for shipping cargo, and into a collapsed unit, for shipping the container only; and in that the preceding components include:

(b) abutting means mounted on the sides of each respective panel for making abutting contact in parallel relation with the abutting means on other respective panels when the container is assembled,

(c) coupling means permanently mounted on the side panel abutting means, the base, and the roof for interconnecting the same, and

(d) coupling means permanently mounted on the front panel for connecting the front panel to at least one of the base, the side panels, and the roof;

(e) the at least one door being pivotally hinged on at least one abutting means of a respective one of the side panels, and

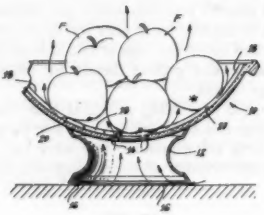


(f) the coupling means for connecting the base and the roof to the side panel abutting means being adapted for directly interconnecting the base and the roof so as to define a space therebetween for containing the side panels, the front panel and the door to form said collapsed unit.

4,506,799
FRUIT BOWL

Stanley I. Mason, Jr., 61 River Rd., Weston, Conn. 06880

Filed Sep. 6, 1983, Ser. No. 529,374
Int. Cl.³ A47F *5/16*; B65D *8/08, 85/34*
U.S. Cl. 220—69 **4 Claims**



1. A receptacle for storing fruit while minimizing any tendency of the fruit to spoil, including

a generally concave bowl having openings in the lower portion thereof,

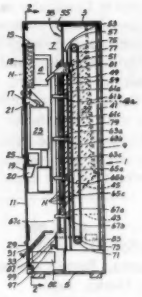
a hollow pedestal base having air inlets therein, said base supporting said bowl and said air inlets connecting through said base with said openings in said bowl to provide a convective air flow pattern upwardly through said base and into said bowl, a plurality of rounded, raidal, spaced ribs on the inner surface of said bowl so spaced as to support fruit above the inner surface of said bowl, said openings being surrounded by said ribs,

whereby fruit may be held in said bowl spaced from the inner surface thereof and subjected to ambient conventive air flow to minimize the spoiling thereof.

4,506,800
MACHINE FOR VENDING ARTICLES SUCH AS NEWSPAPERS, MAGAZINES AND THE LIKE

W. Jack Wingate, Charlotte, N.C., assignor to Hennessy Products, Incorporated, Chambersburg, Pa.

Filed May 19, 1983, Ser. No. 496,089
Int. Cl.[3] G07F *11/28*
U.S. Cl. 221—6 14 Claims



1. A vending machine for flat articles such as newspapers comprising wall structure forming an enclosed cabinet, a storage magazine therein having vertical side walls, a rear wall and an inclined bottom wall and being open at its front, an inclined outlet chute positioned between the front of said storage magazine and the front portion of said cabinet wall structure and substantially aligned with said inclined bottom wall and having a discharge opening in the front portion of said cabinet wall structure communicating with the exterior of said cabinet, a plurality of vertically movable telescoping members forming an obstruction between the storage magazine and the outlet chute, endless vertically disposed flexible elongated elements at each side of the magazine, vertically spaced shafts journaled in the side walls of said magazine and having wheels at their outer ends mounting the upper and lower ends of said flexible elements, said flexible elements being secured to the uppermost of said telescoping members whereby upon movement of said flexible elements in one direction said uppermost telescoping member is lowered and said telescoping members telescope to release individual articles from said magazine and permit them to slide over said uppermost telescoping member onto said outlet chute, power means drivingly connected to one of said shafts, coin-actuated means for energizing said power means, said power means including means responsive to movement of a released article across said uppermost telescoping member for de-energizing said power means and interrupting downward movement of said uppermost telescoping member after each article has passed from said storage magazine onto said chute.

4,506,801
CONSTRUCTION FOR HOLDING PLASTIC FILM

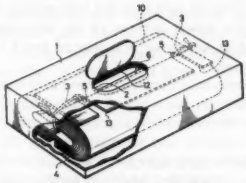
Shingo Origuchi, Tokyo, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,790
Claims priority, application Japan, Dec. 1, 1981, 56-194004
The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.
Int. Cl.[3] B65H *3/58*
U.S. Cl. 221—26 25 Claims

1. A plastic film dispenser comprising:

a hollow container having a take-out opening in a top wall thereof;

a continuous, elongated, strip of plastic film inside said container, said strip having transverse lines of perforation at regularly spaced intervals along its length whereby said strip is partitioned into a multiplicity of easily separable sections, said transverse lines of perforation each including two transversely spaced, elongated cuts, said cuts being arranged in two sets, the cuts of each set being parallel with each other and being aligned with each other in the lengthwise direction of said strip, said sets of cuts being equidistant from the respective side edges of said strip, said strip being folded back and forth upon itself to form a stack of superposed layers, wherein all of said lines of perforation are disposed substantially in vertical registry with each other substantially midway between the lateral edges of said stack of superposed layers and the cuts of each set are vertically superposed in registry with each other, said folded strip being disposed in said container so that an upper end of said continuous strip is



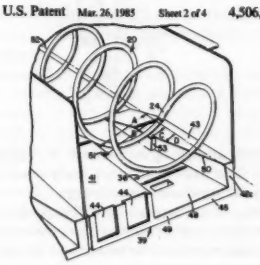
disposed in close proximity to said opening in said container and can be readily drawn therethrough; and

two insert members disposed in substantially fixed positions within said container at opposite ends of said opening and inserted through said sets of cuts, respectively, said folded strip thereby being retained in said container, said insert members having means for binding said folded, continuous plastic film in a bundle, said bundle being retained in said container, whereby when said upper end of said strip is drawn a sufficient distance out of said container, said film becomes taut between said end being drawn out and said insert members, and said film tears across the width thereof at the topmost one of said lines of preforation and one of said sections of said film is thereby drawn from said dispenser.

4,506,802
SHELF CONFIGURATION FOR VENDING MACHINES

Joseph A. Lotspeich, Inver Grove Heights, Minn., assignor to Gross-Given Manufacturing Company, Saint Paul, Minn.

Filed Jun. 14, 1983, Ser. No. 504,266
Int. Cl.[3] G07F *11/36*
U.S. Cl. 221—75 6 Claims



1. Support apparatus for rotatably supporting an elongated semi-rigid helical coil having a center longitudinal axis, of the type used for dispensing articles from a dispensing machine, above a substantially planar shelf surface having a front edge, comprising:

(a) a first elongated coil support member defining a first generally planar upper surface disposed to lie above and

generally parallel to a shelf surface and adjacent a front edge thereof, said first upper surface being terminated at first and second longitudinally opposed ends thereof, said second end proximate the front edge;

(b) a second elongated coil support member defining a second generally planar upper surface disposed to lie above and generally parallel to said shelf surface and adjacent said front edge thereof, said second upper surface being terminated at first and second longitudinally opposed ends thereof, said second end proximate the front edge;

(c) said first and second coil support members being disposed in spaced, generally parallel relationship to one another, and wherein said first and said second coil support members are laterally spaced apart from one another a sufficient distance to cooperatively support a helical coil on and between said first and said second upper surfaces such that the lower surface of the said supported coil is disposed to lie above and spaced apart from said shelf surface; and

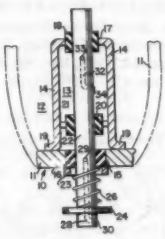
(d) wherein said first and second coil support members each respectively has a lateral width defined by inner and outer edges thereof extending between said first and said second ends thereof, and wherein during the dispensing of the article the distances from the axis of the coil to said inner edges of said first and said second coil support members proximate where the coil is supported respectively are less than the distances from the axis of the coil to said inner edges of said first and second coil support members proximate the forwardmost convolution of the coil respectively, wherein at least the forwardmost convolution of the coil is not supported by said first and second coil support members to further assist the discharge of articles from the dispensing machine.

4,506,803

METERED AEROSOL DISPENSER AND METHOD OF USING THE DISPENSER

Michael L. Franklin, and Fang-Chung Chen, both of Parsippany, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 9, 1982, Ser. No. 406,421
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—1 **20 Claims**



1. Aerosol dispensing apparatus for dispensing metered amounts of fluid material from a main reservoir defined by a container, said apparatus comprising:

(a) a metering chamber having a first aperture that connects the metering chamber to said main reservoir and a second aperture that connects the metering chamber to the exterior of said metering chamber;

(b) a first sealing sleeve mounted on the first aperture;

(c) a second sealing sleeve mounted on the second aperture;

(d) a third sealing sleeve mounted within the metering chamber, all the sleeves being in substantial alignment; and

(e) a stem being positioned for slidable movement within the sleeves, having a dispensing passage adopted to selectively fluidically connect the metering chamber to the exterior of the metering chamber, and a bypass passage adapted to selectively fluidically connect the metering chamber to the main reservoir,

(i) at a first position of the stem, said dispensing passage being located such that the metering chamber is fluidically isolated from the exterior of the metering chamber, and the bypass passage being located such that the meter chamber is fluidically isolated from the main reservoir;

(ii) at a second position of the stem, said dispensing passage sealingly engaging said third sealing sleeve such that said metering chamber is fluidically isolated from the exterior of said container and said bypass passage being located such that said metering chamber and said main reservoir are in fluidic communication; and

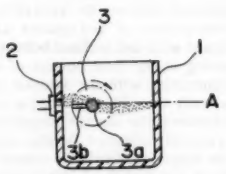
(iii) at a third position of the stem, said dispensing passage being located such that the metering chamber is in fluidic communication with the exterior of said metering chamber, and said bypass passage being sealingly engaged by the first sealing sleeve such that said metering chamber is fluidically isolated from the main reservoir.

4,506,804

VOLUME DETECTING DEVICE

Tateki Oka, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 10, 1983, Ser. No. 456,723
Claims priority, application Japan, Feb. 8, 1982, 57-19130
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—64 **20 Claims**



1. A volume detector for detecting the volume of a powdery material in a container, which comprises:

a first means for generating a periodic wavy motion of said powdery material so as to cause at least a portion of said powdery material to rise above and fall below a predetermined level;

a level sensor disposed adjacent said powdery material undergoing said wavy motion for generating first and second signals, respectively, when at least a portion of said powdery material rises above and falls below said predetermined level; and

a second means for measuring the time period during which either of said first and second signals are generated within a predetermined time period during the operation of said first means so as to detect the volume of said powdery material on the basis of said measured time period.

4,506,805

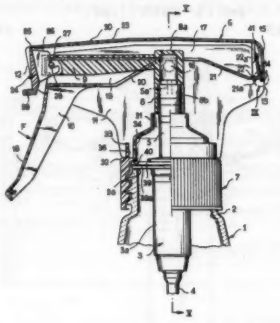
DISPENSER DEVICE FOR LIQUIDS

Christian Marcon, Creteil, France, assignor to Valve Precision S.A.R.L., Palaiseau, France

Filed Jun. 10, 1983, Ser. No. 502,953
Claims priority, application France, Jun. 11, 1982, 82 10179
Int. Cl.³ B67B *5/00*
U.S. Cl. 222—153 **12 Claims**

1. A spraying device for liquids in a container (1) comprising a piston pump (3) which has a suction orifice (4) intended to be immersed in the liquid and a piston rod (5) slidably mounted opposite the suction orifice, this piston rod comprising an outward orifice (5*a*) for the liquid, a case (6) enclosing a delivery tube (8) for mounting on the piston rod (5) which carries

laterally a nozzle (9) for spraying the liquid, a trigger (10) projecting outside the case (6) for controlling depression of the rod (5) of the piston pump and means for removably securing the case (6) to the neck (2) of the container, the case (6) and the trigger (10) being moulded as a single piece on a plastic material, characterized in that said case has an opening (11) which extends from the front face (12), in which emerges the spraying nozzle (9) to a rear face (13), in that the trigger (10) is connected to the rear face (13) of the case by means of a flexible tongue (14) made from a plastic material which allows the trigger (10) to be brought back from a moulding position where it is situated outside the case (6) to a service position inside the case (6), in that the lateral spraying nozzle (9) is free with respect to the case (6) and the trigger (10), and in that the delivery tube (8) comprises bearing surface (16) for the trigger (10).

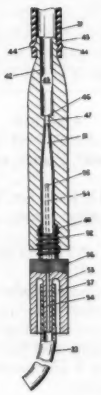


4,506,806

ANIMAL LIQUID LURE DISPENSER

Clark N. Lincoln, Alma, and Norman L. Benzing, Big Rapids, both of Mich., assignors to North American Outdoors, Inc., Alma, Mich.

Filed Sep. 29, 1982, Ser. No. 427,755
Int. Cl.³ A01K *15/00*
U.S. Cl. 222—175 **3 Claims**



1. An animal lure dispenser comprising:

a lure container having vent means in the upper portion thereof and lure egress means in the lower portion thereof and having body carrying means adapted to attach the container to the body of a person using the dispenser;

a lure flow tube, the proximal end of said flow tube in liquid communication with said container and extending from said container lure egress means and further extending downwardly to trailing contact with the ground;

a lure flow regulation valve in liquid flow adjusting communication with the distal end of said flow tube between a flow stopping setting and one or more flow settings for selecting a constant flow rate from said container and said lure flow tube, said regulator including a housing and a valve member in flow communication with the distal end of said lure flow tube, said housing having an axial bore and a valve seat portion and said valve member has an axial bore from one end to a point intermediate the other end and at least one side port in liquid flow communication with said valve bore and said housing bore, the other end of said valve member received in said housing bore and engageable with said valve seat portion; and

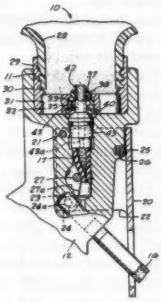
sealing means at one end of said valve member to prevent liquid flow between said housing bore and said valve member except through said side port when said other end of said valve member is disengaged from said valve seat portion.

4,506,807

POWDER DISPENSING CONTAINER FOR DRIPLESS ASSEMBLY TO AND DISASSEMBLY FROM A FLAME SPRAYING TORCH

James Y. Anderson, 1838 Cliffhill Dr., Monterey Park, Calif. 91754

Filed Apr. 13, 1983, Ser. No. 484,449
Int. Cl.³ B67D *5/06*; B65D *47/00*
U.S. Cl. 222—181 **4 Claims**



1. That improvement in a powder dispensing container adapted to be telescopically assembled over the inlet end of a tubular powder feeding device of a flame spraying torch which improvement comprises:

a powder container having an outlet closed by cap means;

said cap means having a powder dispensing passage therethrough normally closed by a cylindrical plug of elastomeric material having a chamber between the opposite ends thereof formed between inner and outer diaphragms extending crosswise of said plug, said inner diaphragm having a normally closed slit extending thereacross and said outer diaphragm having an aperture aligned with said slit and sized to have a snug wiping fit with the exterior of the inlet end of said powder feeding device whereby during telescopic assembly of said cap over the inlet of said powder feeding device said apertured diaphragm is in snug contact with said tubular inlet before the advance end thereof engages and opens said slit in said inner diaphragm; and

said cap means including means press-fitted into the outer end of said powder dispensing passage in overlapping relation with the rim edge of the outer end of said plug for holding said plug assembled to said cap means.

4,506,808

DISPENSER CAP FOR A PRESSURIZED CONTAINER AND A CORRESPONDING UNIT

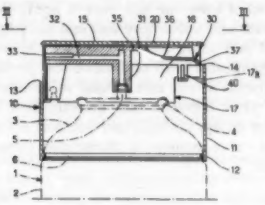
Antonin L. Goncalves, Grosla,, France, assignor to L'Oreal, Paris, France

Filed Nov. 19, 1982, Ser. No. 443,052

Claims priority, application France, Dec. 3, 1981, 81 22650; Apr. 7, 1982, 82 06074

Int. Cl.³ B67D *5/06*; B65D *83/00*

U.S. Cl. 222—182 **16 Claims**



1. A dispenser cap for a pressurised container of the "aerosol can" type having an annular crimped rim and a valve mounting cap carrying a discharge valve to be actuated by said dispenser cap and an outlet member to discharge fluid through said dispenser cap, when actuated, such cap comprising:

(a) first and second cap parts, the first cap part comprising a generally cylindrical cap body and said second part of the cap comprising a push button movable within said generally cylindrical cap body;

(b) catch engagement means for fixing said first cap part on the side wall of a said pressurised container;

(c) a top panel to said first cap part;

(d) means on said first cap part defining guides integral with the said cap body and connected to said top panel of the first cap part for guiding said push button for pivotal movement within said first cap part;

(e) an ejection nozzle connected to said push button;

(f) means on said push button defining a duct of bent shape having an axial branch for cooperating with the outlet member of a said associated container and a radial branch which communicates with said ejection nozzle;

(g) operating tongue means connected to said push button extending at least in a zone thereof remote from said radial branch of the duct, and substantially perpendicular to said axial branch of the duct means, said push button having a length measured perpendicular to the axis of the cap body which is substantially equal to the inner diameter of the said cap body said operating tongue means of the push button being substantially disposed at the level of said top panel of the first cap part;

(h) an extension of said push button adjacent to said ejection nozzle, said extension being parallel to said axial branch of the duct means and aligned in a direction which extends toward said catch engagement means of the first cap part, said extension having a proximal end near said ejection nozzle and a distal end remote therefrom;

(i) two coaxial pin means adjacent said distal end of the extension for articulating the push button on the cap body;

(j) means on said cap body defining a window in register with said ejection nozzle of the push button;

(k) means defining recesses arranged at the bottom of said guides of the cap body, said recesses opening downwardly toward the container and arranged near said window thereof receiving said pin means and thereby defining an axis of articulation substantially at the level of the end of said discharge valve outlet member, said two coaxial pin means being integral with the said extension and being catch-engaged within said recesses; and

(l) means on said guide means adapted to abut the annular crimped rim of a said pressurised container discharge valve mounting cup when the dispenser cap is catch-engaged on the said container.

4,506,809

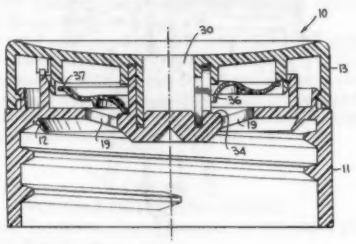
DISPENSING FITMENT FOR SQUEEZE BOTTLES

Douglas F. Corsette, Los Angeles, Calif., assignor to Calmar, Inc., City of Industry, Calif.

Filed Jun. 25, 1982, Ser. No. 392,327

Int. Cl.³ B05B *11/04*

U.S. Cl. 222—213 **18 Claims**



1. A manually operable dispensing fitment for fluid tight engagement with the outlet opening of a squeeze bottom containing a product to be dispensed:

the fitment comprising a combined discharge and vent fluid passage establishing communication between the atmosphere and the interior of the squeeze bottle;

the fitment defining a pair of annular valve seats of different diameters;

and the fitment including an annular, resilient and preloaded diaphragm valve extending across the fluid passage, the valve being loosely fitted to the fitment and bearing against said valve seats which solely apply opposing forces acting against the valve in an axial direction of the fitment for normally closing the passage upon equalization of pressure on opposite sides of the valve, the valve being deformed by flexure only and without stretching into a discharge open position in which the valve is axially unseated unidirectionally from one of the valve seats when the pressure within the bottle exceeds atmospheric pressure, and the valve being deformed into a vent open position in which the valve is axially unseated unidirectionally from the other of the valve seats when the pressure within the bottle is reduced below atmospheric pressure.

4,506,810

DOSAGE DISPENSER DEVICE

Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Jul. 13, 1982, Ser. No. 397,862

Claims priority, application France, Jul. 21, 1981, 81 14132; Jun. 29, 1982, 82 11422

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—391 **9 Claims**

1. A dispenser for a viscous product comprising:

(a) a substantially rigid barrel having an open end and having towards the other end an inner wall partition provided with a passage opening, said barrel being a molded component and defining a compartment for containing the product to be dispensed;

(b) means defining a discharge passage for said product and adapted to be mounted on said open end of said barrel;

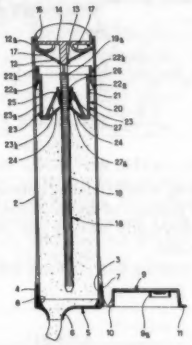
(c) manually operable push button means at the other end of the barrel and integral with a rack passing through said passage opening, in order to displace said rack between a first and a second position, said rack having teeth;

(d) a molded piston mounted for sliding in a leakproof manner with frictional contact along the said barrel from the

inner wall partition to the open end of the barrel, said piston comprising molded integrally with it:

sealing lip means adjacent the center of the piston bordering a rack passage and providing a seal between the rack and the piston, said lip means being provided at the lower part of a skirt connected by walls, which converge toward said other end, to a cylindrical wall of the piston;

catch-engagement means comprising elastic flap means adapted to engage the teeth of the rack, said elastic flap



means being convergent toward said other end of said barrel to define a catch engagement lip which is adjacent said sealing lip, said catch-engagement means being effective to impart to the piston the movement of the rack from said first position to said second position, but being flexible so as to move over the rack teeth when said rack moves toward said other end of the barrel, said piston being of a size that said piston is insertable through said open end of said barrel and said rack being insertable through the other end of said barrel and through said passage opening in said piston.

4,506,811

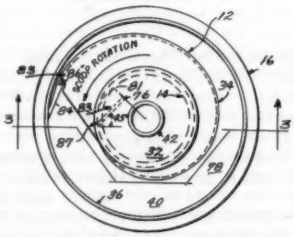
MECHANICAL CONSTRUCTION ARRANGEMENT FOR ROTARY FLOW FEEDER

Frank J. Miksitz, Phillipsburg, N.J., assignor to UFI Engineering & Manufacturing Co., Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 291,765, Aug. 10, 1981, Pat. No. 4,411,377. This application Jun. 9, 1982, Ser. No. 386,669

Int. Cl.³ B65G *21/18*

U.S. Cl. 222—411 **8 Claims**



1. In a rotary feeder for feeding granular material downwardly with gravity assist through a feed aperture: a stationary container having a side wall and having a generally horizontal wall in which the feed aperture is located; a rotatable feed assembly located above the feed aperture, said assembly including a vertical shaft and a plow blade secured to the shaft for contacting granular material and urging it over the edge of the feed aperture; a support fixture fixedly connected to the container, said fixture including a stationary, vertically-elongated, stiff support axle coaxial with said feed assembly shaft; vertically spaced-apart bearing means coaxial with said feed assembly shaft and connected to said feed assembly shaft and to said stationary support axle such that said feed assembly is rotatable about a vertical axis relative to said stationary support axle and such that the weight of said feed assembly is supported by said stationary support axle; and drive means supported independently of said support fixture, said drive means being drivably connected to said feed assembly to rotate the same relative to said support fixture.

4,506,812

WIDE-MOUTHED ISOTHERMAL CONTAINER, EQUIPPED WITH AN IMMERSED PUMP

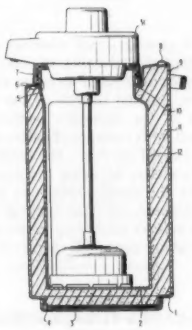
Elias M. DeFreitas, Porto Alegre, Brazil, assignor to Termolar S/A, Porto Alegre, Brazil

Filed Jan. 26, 1982, Ser. No. 342,970

Claims priority, application Brazil, Feb. 27, 1981, 6100280

Int. Cl.³ D65D *83/00*

U.S. Cl. 222—536 **6 Claims**



1. A wide-mouthed isothermal container equipped with an immersed pump comprising an outer case (1), having a lower slightly conical screw-threaded projection (4) finished by a bottom (3), said outer case having an upper opening (10), an inner container (2) having a neck projection (5) which passes through the opening of said outer case, a projection (9) opposite to said opening (10) and a hump formed on projection (9), said neck projection having external rims (6) forming a groove clamped to the upper opening (10) of the outer case, said neck projection having an external screw-thread (7), said container having a pouring spout (31), there being an empty space (11) between the outer case and inner container, said space being filled with expanded plastic; a pump (31) fitted into the container; a handle (17) attached to the outer case, wherein the neck (5) of the inner container (2), and the opening (10) of the outer case (1), are each disposed eccentric with respect to the symmetrical axis of the container.

4,506,813

TUBULAR ASSEMBLY, METHOD OF PREPARING THE ASSEMBLY, APPARATUS FOR UPHILL TEEMING WHICH INCORPORATES THE ASSEMBLY AND METHOD OF CASTING METAL

Dughan, Terence G., 1, The Green, Storrs, Stannington, Sheffield; Farmery, George M., "Rangitoto" Sheffield Rd., Oxspring, Sheffield, and Payne, Derick A., 38 Folds Crescent, Sheffield, all of England

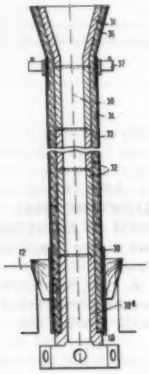
PCT No. PCT/GB80/00214, § 371 Date Aug. 17, 1981, § 102(e) Date Aug. 17, 1981, PCT Pub. No. WO81/01674, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 12, 1980, Ser. No. 293,233

Claims priority, application United Kingdom, Dec. 15, 1979, 7943268; Feb. 26, 1980, 8006412; Dec. 5, 1980, 8039067

Int. Cl.[3] B22D *41/08*

U.S. Cl. 222—590 **1 Claim**



1. A method of casting metal wherein a guide assembly is prepared by arranging a plurality of tubular elements of ceramic material end-to-end inside an outer tube with an annular space between the internal surface of the outer tube and the external surfaces of the elements, particles of a refractory material are coated with a curable binder, the annular space is packed with the coated particles, the binder is cured, molten metal is guided by means including the guide assembly from a source to a mould, the metal solidifies in the guide assembly, the outer tube burns and, after the metal in the guide assembly has solidified, the mass of refractory particles and the elements of ceramic material are disrupted to expose the metal.

4,506,814

REVOLVING-LADLE TURRET FOR CONTINUOUS CASTING PLANTS

Franco Adorni, Milan, Italy, assignor to Innse Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Sep. 28, 1982, Ser. No. 425,652

Claims priority, application Italy, Oct. 2, 1981, 24273 A/81

Int. Cl.[3] B22D *41/00*

U.S. Cl. 222—591 **3 Claims**

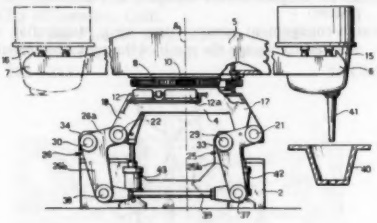
1. Revolving-ladle turret comprising:

a fixed base structure;

a turret member supported by and moveable relative to said base structure;

a pair of linkage means for interconnecting said base structure and said turret member, each of said linkage means comprising a first and a second bell crank, each bell crank having an upper arm with an outer end connected to a portion of said turret member, an intermediate portion connected to said base structure so that the bell crank is pivotally moveable, and a lower arm, said linkage means further comprising a rod interconnecting lower portions of said lower arms so that upward movement of an upper arm of one of said bell craks results in upward movement of the upper arm of the other bell crank of the linkage means and upward movement of said turret member;

a platform supported by said turret member for rotation about a vertical axis;



ladle-carrying arms extending outwardly from diametrically opposed portions of said platform;

means for vertically moving said platform and said turret member; and

means for rotating said platform with respect to said turret member.

4,506,815

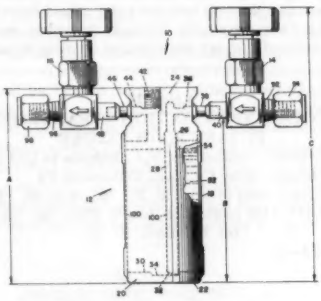
BUBBLER CYLINDER AND DIP TUBE DEVICE

Andreas A. Melas, Burlington, and John W. O'Grady, Jr., Gloucester, both of Mass., assignors to Thiokol Corporation, Chicago, Ill.

Filed Dec. 9, 1982, Ser. No. 448,160

Int. Cl.[3] B65D *83/00*

U.S. Cl. 222—630 **9 Claims**



1. A cylinder and dip tube device including

a container, said container containing an elongated metallic cylindrical portion having an inner surface defining a volume the cross section of which is substantially uniform through the length of said cylindrical portion, a bottom metallic closure portion having a flat bottom and an inner surface, and a top metallic closure portion, said top closure portion having an inlet opening and an outlet opening, said cylindrical bottom and top portions being welded to a respectively associated end of said cylindrical portion in a sealing manner,

a metallic dip tube depending from one end, within said cylindrical portion, from said top closure portion and having a connection to said inlet opening, the other end of said dip tube being disposed adjacent said inner surface of said bottom closure portion,

a protective coating, the inner surfaces of said cylindrical portion and bottom closure portions and said dip tube being coated with said protective coating to provide a

barrier to contamination of reactive material contained in said container by the metal of said cylindrical portion, said bottom closure portion, and said dip tube,

inlet controllable valve means having inlet and outlet connecting means,

outlet controllable valve means having inlet and outlet connecting means,

a first pipe connection between said inlet opening of said top closure portion and said outlet connecting means of said inlet controllable valve means, said first pipe connection being sealed by welding, and

a second pipe connection between said outlet opening of said top closure portion and said inlet connecting means of said outlet controllable valve means, said second pipe connection being sealed by welding.

4,506,816

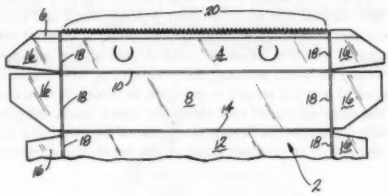
SERRATED CUTTING EDGE FOR SHEET MATERIAL DISPENSER AND METHOD OF FORMING THE SAME

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 13, 1983, Ser. No. 541,689

Int. Cl.³ B26D *1/02*

U.S. Cl. 225—48 **7 Claims**



1. In a carton for dispensing sheet material from a roll thereof, a cutting edge for severing portions of the sheet material from the roll, said cutting edge comprising:

(a) a composite comprising a plastic sheet component and a paperboard component bonded together in face-to-face contact;

(b) a plurality of cutting teeth formed in said composite with each of said teeth comprising side edges which coverage from a root portion to a point portion;

(c) said sheet component and said paperboard component of said composite being coextensive with each other from said root portions to said side edges and said point portions of said cutting teeth; and

(d) said cutting teeth being compacted with the thickness of said composite being reduced at said side edges and said point portions of said cutting teeth while the thickness of said composite is substantially non-reduced at said root portions of said cutting teeth.

4,506,817

DEVICE FOR OPENING AMPOULES

Andrew E. Parker, 6 Winston Gardens, Belfast BT5 6HZ, Northern Ireland

Filed Dec. 20, 1982, Ser. No. 451,083

Claims priority, application United Kingdom, Dec. 23, 1981, 8138682

Int. Cl.³ C03B *33/06*

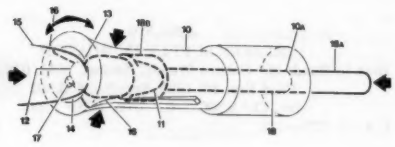
U.S. Cl. 225—96.5 **5 Claims**

1. A device for opening ampoules comprising an elongated body dimensioned to accommodate an ampoule head and having an open end of circular section whereat is an inwardly-directed annular bead against which the neck of an accommodated ampoule can be broken,

an outwardly directed peripheral flange extending from said open end of the body to accommodate the shoulder of the body portion of an ampoule,

a cutter protruding from said annular bead with a cutting portion extending radially inwardly to abut against the neck of an accommodated ampoule,

a plunger being located internally of the other end of the



body with its rod journalled in a bearing in said other end and extending outwardly therefrom, the plunger being operated manually while the body is held, wherein a wall of the body is elongately slit along a predetermined length at opposed wall regions thereof to enable parts of a peripheral wall at the open end to flex relatively apart to allow entry of a head portion of an ampoule.

4,506,818

DEVICE FOR THE PURPOSE OF PUSHING SECTIONS OF A WIRE THROUGH A SOLID BODY CONSISTING OF YIELDING MATERIAL

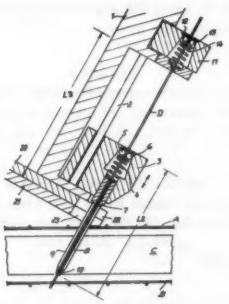
Gerhard Ritter; Klaus Ritter; Josef Ritter, and Edgar Pollhammer, all of Graz, Austria, assignors to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed Feb. 28, 1983, Ser. No. 470,637

Claims priority, application Austria, Mar. 2, 1982, 800/82

Int. Cl.³ A43D *61/00, 69/00;* **B25C** *5/04*

U.S. Cl. 227—67 **3 Claims**



1. Device for the purpose of pushing sections of a wire through a solid body consisting of yielding material, for example foam material or minerally bound wood fibers, with this being accomplished by means of a hollow needle, characterized in that a wire-feed-clamp (3), which produces a one-side gripping effect, can be moved along an alignment element (2) which, in fixed position, is arranged on a carrier (1), whereby the hollow needle (8) is arranged at the front side of the wire-feed-clamp (3), and in that at the rear extremity of the alignment element (2), and in a non-movable manner with respect to the carrier (1), a return-motion stopping element (11) is arranged for the wire, which return-motion stopping element (11), in the same sense as the feed-clamp (3), produces a one-sided gripping effect and is aligned with the hollow needle (8), and in that in front of the alignment element (2) a cutting element (20, 21) is arranged for the purpose of cutting-off, after retraction of the feed-clamp (3) along guiding element (2) up to

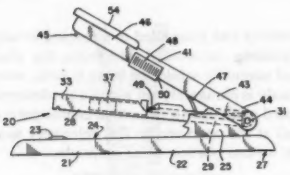
the point of release of the forwardly advanced section of wire D, the wire section which has been pushed through the solid body.

4,506,819

STAPLE SUPPLY INDICATOR

Burt E. Rand, 169 Coburn Woods, Nashua, N.H. 03063

Filed Sep. 19, 1983, Ser. No. 533,605
Int. Cl.³ B25C *5/02, 5/06;* B25F *7/00*
U.S. Cl. 227—120 **8 Claims**



1. In a stapler having an elongated anvil member, an elongated staple magazine member, and an elongated driver member, all pivoted to each other at one end thereof, the staple magazine member having a longitudinally movable staple follower spring urged away from said pivot and said magazine and driver members having cooperable, longitudinally movable latch means, releasably connecting them together, the combination of:

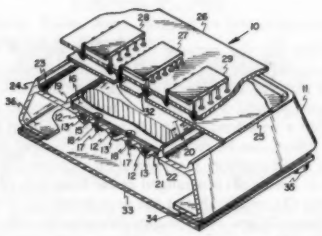
means connecting said longitudinally movable staple follower to said longitudinally movable latch means for releasing said latch means when said staple follower nears the end of its path, thereby releasing said driver member from said magazine member.

4,506,820

DESOLDERING DEVICE

John P. Brucker, 49 Timber Ridge, Los Alamos, N. Mex. 87544

Filed Jul. 29, 1983, Ser. No. 518,748
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—39 **9 Claims**



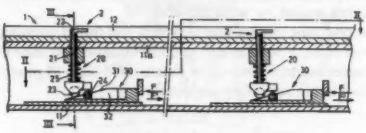
1. An apparatus for removing or replacing multipin devices in printed circuit boards comprising a solder pot, molten solder and flexible mask means; said flexible mask means fabricated with at least one precut hole or slot to expose the pins of the device being removed.

4,506,821

ALIGNING AND WELDING SHEET PLATE EDGES

Joseph Bernou, Parthenay, and Georges Sguazzi, Enghien-les-Bains, both of France, assignors to La Soudure Autogene Francaise, Paris, France

Filed Jan. 31, 1983, Ser. No. 462,329
Claims priority, application France, Feb. 19, 1982, 82 02733
Int. Cl.³ B23K *37/04*
U.S. Cl. 228—5.7 **10 Claims**



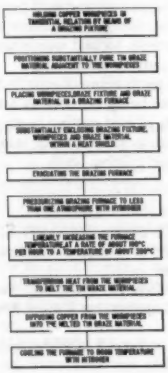
1. In a combination of a longitudinal welding bench and a device for aligning an edge of a sheet or plate for the purpose of edge-to-edge assembly of the same on said welding bench with another sheet or plate element or with another edge of itself, wherein said device is disposed on said longitudinal welding bench and is provided with a workpiece-carrier beam, of the type comprising a plurality of positioning members situated on a line along which said elements are to be lined up and then welded, the improvement wherein each said positioning member comprises a finger displaceable in vertical translation and in rotation about a vertical axis and a member for controlling its linear and angular positioning, said finger being arranged to assume an active position in which it is in contact with the edge of one of said elements, and a retracted position in which it permits the laying alongside of the edge of a second said element or of another edge of the same said element.

4,506,822

METHOD FOR BRAZING TOGETHER PLANAR AND NONPLANAR METAL MEMBERS

Fred G. Hammersand, East Petersburg, and Anthony J. Witkowski, Lancaster, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 18, 1982, Ser. No. 359,423
Int. Cl.³ B23K *29/02, 35/12*
U.S. Cl. 228—200 **4 Claims**



2. A method of brazing a copper coolant pipe to a surface of a copper electrode using at least one filament of substantially pure tin braze material to form a braze joint, said brazing being performed within a brazing furnace, the method comprising the steps of:

holding said copper coolant pipe in tangential relation to a portion of said surface of said copper electrode thereby forming a cavity thereinbetween;

positioning said filament of tin braze material within said cavity;

shielding said braze material from direct furnace radiation;

exposing said coolant pipe, copper electrode and braze material to a hydrogen atmosphere;

linearly increasing the furnace temperature at a rate of about 180° C. per hour to about 350° C.; and

cooling said furnace to room temperature by introduction of a nitrogen atmosphere.

4,506,823

LETTER CARD AND CONFINING MEANS THEREFOR

Ingrid Büchler, Merzig, Fed. Rep. of Germany, assignor to Villeroy & Boch Keramische Werke KG, Mettlach, Fed. Rep. of Germany

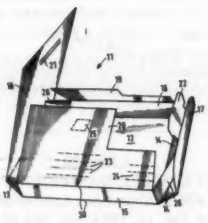
Continuation-in-part of Ser. No. 308,090, Oct. 2, 1981, Pat. No. 4,401,258. This application Aug. 17, 1983, Ser. No. 524,032

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105728

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.[3] **B65D** *85/30*; **B42D** *15/02*

U.S. Cl. 229—92.8 **20 Claims**



1. A letter, comprising a letter card including at least one relatively thin plate consisting of a ceramic material and having a first side bearing permanently applied decorative material in the form of one or more images and/or lettering and a second side; a sheet of stationery material applied to the second side of the plate; means for displaying the plate; and a shock-absorbent envelope for at least substantial concealment and confinement of the letter card and for protecting the letter card against damage during mailing or other forms of shipment.

14. A letter, comprising a letter card including at least one relatively thin plate consisting of a ceramic material and having a first side bearing permanently applied decorative material in the form of one or more images and/or lettering and a second side capable of receiving and retaining a written or printed message; means for displaying said plate for observation of said first side thereof, said displaying means being disposed within the confines of said plate at said second side thereof; and a shock-absorbent envelope for at least substantial concealment of the letter card and for protecting the latter against damage during mailing or other forms of shipment.

19. As a novel article of manufacture, a letter card including at least one relatively thin plate consisting of a ceramic material and having a first side bearing permanently applied decorative material in the form of one or more images and/or lettering and a second side capable of receiving and retaining a written or printed message, said plate having an outline other than a rectangular outline; and means for displaying said plate for the observation of said front side thereof.

4,506,824

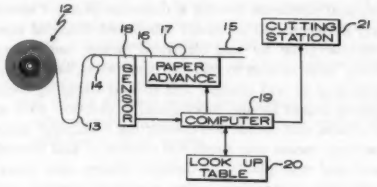
PAPER CUTTER

Stephen A. Bartz, Jordan, Minn., assignor to Lucht Engineering, Inc., Minneapolis, Minn.

Filed Feb. 17, 1982, Ser. No. 349,648

Int. Cl.[3] **B26D** *5/32*

U.S. Cl. 234—28 **15 Claims**



1. A paper cutter for separating exposure areas of varying sizes positioned along the longitudinal axis of a web of photographic material and for separating individual print areas within an exposure area including at least some print areas positioned relative to each other along the transverse axis of the web of photographic material, the photographic material being uniquely coded for each exposure area in accordance with the particular array of print areas to be separated and the cutter including means for decoding the code and producing a signal uniquely representative of the array of print areas to be separated, the cutter further comprising:

cutting station means including a plurality of blade means selectively movable to cut portions of said web positioned at predetermined locations within said cutting station means;

means responsive to said signal for selectively moving said blade means in accordance therewith; and

means responsive to said signal for advancing said web through said cutting station means by an amount established by said signal.

4,506,825

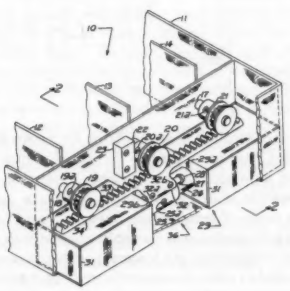
SOLENOID OPERATED DAMPER BLADES

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed Jan. 26, 1983, Ser. No. 461,277

Int. Cl.[3] **F24F** *13/14*

U.S. Cl. 236—9 A **14 Claims**



1. Automatic damper means controlling the flow of a conditioned medium from a heating/cooling device to rooms or zones, said damper means comprising a damper device having a multiplicity of pivotally mounted damper blades; rotatable means rotating said damper blades within an adjustable housing of said damper device, solenoid motor means energized by electrical means; switch means energizing and de-energizing

circuits of said electrical means; carriage means providing mechanical connection between said solenoid motor means and said rotatable means; engaging means; said engaging means having connection to said carriage means and providing interaction between said rotatable means and said carriage means; sound dampening means surrounding said solenoid motor means, adjustable stops, a timer switch, and a damper closing controller; said solenoid motor means comprising dual linear solenoids; said solenoids having a common plunger moving alternately between said solenoids when said solenoid motor means are energized by said electrical means; said plunger transmitting linear motion to said carriage means; said carriage means attaching to said plunger and to said engaging means; said engaging means having mechanical interaction with said rotatable means; said interaction converting rectilinear motion of said carriage means into rotational motion of said rotatable means and said multiplicity of damper blades; said damper closing controller comprising a relay, electrical contacts, and a high temperature thermostatic switch; said contacts being opened and closed by said relay; said thermostatic switch being insertable in a flue or like location in said heating/cooling or like device and operating said solenoid motor means of said damper means; said electrical means having thermostatic means controlling said motor means and fuel control means of said heating/cooling device in combination.

4,506,826

TIME-CONTROLLED HEAT REGULATOR WITH NIGHTTIME TEMPERATURE LOWERING CAPABILITY

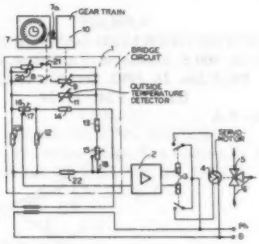
Gerd Kammerer, St. Georgen, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,548

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202104

Int. Cl.³ F23N *5/20*

U.S. Cl. 236—46 R **8 Claims**



1. A time-controlled heat regulator for controlling a means for supplying heat to an area to be heated comprising:

a control loop including a variable resistor and an outside temperature sensor exhibiting a resistance corresponding to the value of temperature outside of said heated area;

a means for cutting said variable resistor into said control loop at a beginning of a longest possible period which may be needed to raise the temperature of said area to a desired temperature, the beginning of said period being selected in dependence upon said outside temperature; and

a means for chronologically changing the resistance of said variable resistor after said variable resistor is cut into said control loop, said regulator activating said means for supplying heat when the resistance of said variable resistor equals said resistance corresponding to said outside temperature and deactivating said means for supplying heat at the end of said period.

4,506,827

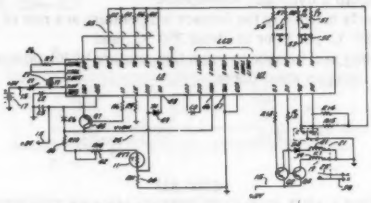
BATTERY POWERED THERMOSTAT

J. Scott Jamieson, and Henry A. Gleason, III, both of Goshen, Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Oct. 17, 1983, Ser. No. 542,510

Int. Cl.³ F23N *5/20*

U.S. Cl. 236—46 R **4 Claims**



1. A battery powered thermostat including:

a sensor for providing a signal representative of the actual temperature within a space;

a microcomputer connected to said sensor and intermittently utilizing power at a first level when in an operating state for controlling an isolating interface relay in response to said temperature signal;

a voltage sensing circuit connected to said microcomputer and including a temperature indicating resistor, said sensing circuit and said microcomputer being adaptable to periodically compare a voltage across said resistor with the voltage of a battery and generate a signal when said resistor voltage is equal to a predetermined percentage of said battery voltage, and;

a network connected to said microcomputer for permitting the conversion of said thermostat between Fahrenheit and centigrade control modes.

4,506,828

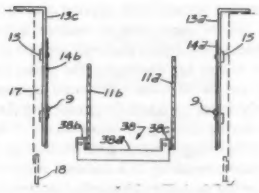
REVERSIBLE DAMPER MEANS

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed Jun. 16, 1983, Ser. No. 504,886

Int. Cl.³ F24F *13/14*

U.S. Cl. 236—49 **12 Claims**



1. Automatic damper means, having thermostatic means, controlling and regulating the flow of a heating/cooling medium traversing between a central heating/cooling appliance and individual rooms or zones via a duct network; said damper means having in combination:

(a) a housing means;

said housing means comprising an enclosure having adjustable support means, and motor covering means; said enclosure containing closure means and transmission means, said housing means, having open top and bottom sections, adapted to be mounted in floor, wall and ceiling recesses;

(b) said closure means;

said closure means comprising damper blade means rotatably mounted in said enclosure; said damper blade

means opening and closing said enclosure in cooperation with said thermostatic means;

(c) said transmission means;

said transmission means comprising motor means having a shaft connecting to a driven blade of said damper blade means;

(d) control means;

said control means energizing and controlling said transmission means, said control means comprising said thermostatic means, said thermostatic means providing electrical interlocks between fuel control means of said heating/cooling appliance and motor control means, and between said fuel control means and said transmission means; first and second switch means operating by automatic and manual means respectively; and first and second light means respectively connecting said thermostatic means to said said motor control means and interlocking said fuel control means and said motor means;

(e) said support means;

said support means comprising movable brackets having mobility along an axis having fastening means; said mobility permitting adjustment of said enclosure in recesses, said fastening means attaching said brackets to enclosure panels, said brackets providing support for said enclosure on external means;

(f) said motor control means;

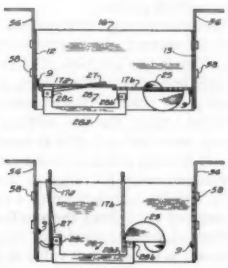
said motor control means comprising a coil and contacts and a high temperature switch; said coil electrically interlocking with said thermostatic means and controlling operation of said motor means.

4,506,829

VARIABLE SPEED DAMPER MEANS

Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228

Filed Jun. 24, 1983, Ser. No. 507,474
Int. Cl.³ F24F *13/14*
U.S. Cl. 236—49 **14 Claims**



1. Automatic damper means, having speed changing means controlling and regulating the flow of a heating/cooling medium through a duct network; said duct network attaching to heating/cooling means having fuel control means, said fuel control means and said damper means being simultaneously controlled by thermostatic means; said damper means comprising in combination:

(a) housing means,

said housing means comprising a frame having open top and bottom sections, said frame having adjustable support means mounting thereon;

(b) closure means,

said closure means pivotally mounting in said housing means and rotatable between open and closed positions by transmission means;

(c) said transmission means,

said transmission means comprising motor means, switch operating means, and said speed changing means; said transmission means mounting to said housing means;

(d) indicating means,

said indicating means communicating the operational status of said heating/cooling means and a relative position of said closure means in said housing means;

(e) control means,

said control means comprising said thermostatic means, switch means and motor control means; said thermostatic means providing an electrical interlock between said transmission means, said indicating means, said motor control means, and said fuel control means;

(f) motor control means,

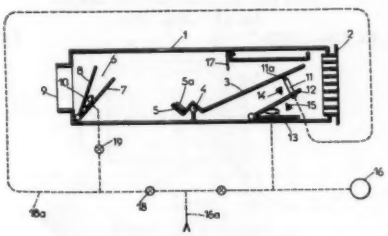
said motor control means comprising a coil and a high temperature switch connecting said motor means to said fuel control means.

4,506,830

DEVICE FOR SIMULTANEOUS CONTROL OF AIR FLOW AND CIRCULATION SPEED FOR AN AIR CONDITIONING INSTALLATION WITH VARIABLE AIR FLOW

Georges Francel, 7 Boulevard Auguste Raynaud, 06110 Nice, France

Filed Mar. 30, 1984, Ser. No. 595,468
Claims priority, application France, Apr. 1, 1983, 83 05645
Int. Cl.³ F24F *7/00*
U.S. Cl. 236—49 **13 Claims**



1. In a distributor means for distributing conditioned air into a room, said distributor means including a diffuser at its downstream end for discharging the conditioned air into the room and a shutting device located immediately upstream of said diffuser for controlling the flow of conditioned air which passes thereby towards said diffuser, said shutting device being mechanically biased so as to move to reduce the flow of conditioned air which flows therepast towards said diffuser yet movable against said bias by the pressure of the conditioned air flowing therepast to increase said flow of conditioned air, the improvement wherein said distributor means includes

(a) a sensor which is capable of emitting signals when contacted by said shutting device, said sensor being located so as to be contactable by said shutting device when it is moved in response to increases in the pressure of the conditioned air flowing therepast,

(b) first adjusting means, said first adjusting means being associated with said sensor to control its positioning with respect to said shutting device in response to the conditions in said room,

(c) an air damper located upstream of said shutter device, said air damper being movable to control the flow of conditioned air towards said shutter device such that said shutter device can be caused to move in a constantly oscillating fashion in and out of contact with said sensor, and

(d) second adjusting means, said second adjusting means being associated with said air damper so as to control its positioning in response to signals from said sensor.

4,506,831

PROCESS FOR THE SPRAY APPLICATION OF PLANT PROTECTIVE SPRAY MIXTURES AND PACKING UNITS FOR CONCENTRATES

Miklos Ghyczy, Cologne; Paul-Robert Imberge, Pulheim, and Armin Wendel, Cologne, all of Fed. Rep. of Germany, assignors to Nattermann & Cie GmbH, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,663

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225705

Int. Cl.³ A01N *25/30*; B65D *85/00*

U.S. Cl. 239—10 16 Claims

1. Process for the discharge on open ground of plant protectant spray mixtures containing phospholipids in the form of spray mist, with droplet sizes which avoid undesirable drift, wherein commercially available active ingredient concentrates and phospholipid concentrates are first diluted with water to form spray mixtures and the diluted mixtures are mixed before spraying.

4,506,832

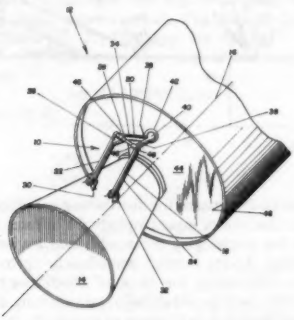
ANTIROTATION LINKAGE FOR ROCKET MOTOR NOZZLES AND OTHER MECHANISMS

Lawrence C. Faupell, North Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Dec. 27, 1982, Ser. No. 453,316

Int. Cl.³ B64C *15/00*

U.S. Cl. 239—265.35 2 Claims



1. An antirotation linkage that permits angular deflection of a first member with respect to a primary axis of a second member on which said first member is mounted for rotation, while restricting rotation of the first member about such primary axis comprising,

a U-shaped first link having two substantially parallel legs and a hollow cross bar with the end of each of said legs remote from said cross bar being pivotally attached to said first member,

a ball-and-socket joint connected to said second member, said ball-and-socket joint having a ball,

a pin, and

a V-shaped second link having two legs with the point thereof fixed to the said ball of said ball-and-socket joint, with said legs each having a hole in the end remote from said ball and disposed in cooperative relation with said cross bar of said U-shaped first link, and with said pin passing through said cross bar and through said holes in the ends of said legs of said V-shaped link, whereby said U-shaped first link and said V-shaped second link are attached pivotally together.

4,506,833

FUEL INJECTION NOZZLE FOR AN INTERNAL COMBUSTION ENGINE

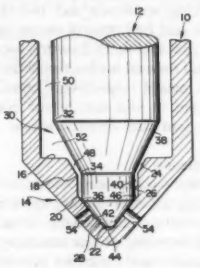
Kenji Yoneda, Atsugi; Kunihiko Sugihara, Tokyo, and Shoji Ushimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 29, 1982, Ser. No. 428,222

Claims priority, application Japan, Nov. 9, 1981, 56-179242

Int. Cl.³ F02M *45/08*

U.S. Cl. 239—533.4 3 Claims



1. A fuel injection nozzle for an internal combustion engine, comprising:

(a) a hollow nozzle body having an orifice extending from the inside to the outside thereof;

(b) a valve member liftably disposed in the nozzle body;

(c) the nozzle body and the valve member establishing, inside the nozzle body, a space to which fuel is supplied;

(d) the valve member contacting the nozzle body at a position between the space and the orifice so as to block communication therebetween when the valve member is in the unlifted position and to establish communication as the valve member lifts, whereby fuel to be injected enters the orifice from the space as the valve member lifts and is prevented from entering the orifice when the valve member is in the unlifted position;

(e) the valve member having a first surface extending in the direction of lift thereof, the nozzle body having a first surface extending in the direction of lift of the valve member, the nozzle body first surface being inside the nozzle body and being at a position downstream of the space but upstream of the orifice, the first surfaces defining a gap having a cross-sectional area that is smaller than that of the orifice and remains constant as the valve member lifts through a predetermined lift range so that (1) the rate of fuel injection initially increases up to a constant valve as the valve member rises from the unlifted position to a position within the predetermined lift range, (2) the injection rate remains at the constant value as said valve member continues to rise within the range, and (3) the injection rate increases above the constant value as the valve member lifts to a position above the predetermined lift range, wherein the magnitude of the cross sectional area of the gap determines the constant value;

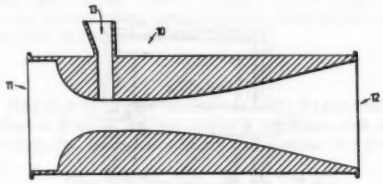
(f) the nozzle body having a second surface extending obliquely with respect to the direction of lift of the valve member, the valve member having a second surface extending generally parallel to the nozzle body second surface, the second surfaces being arranged to contact and separate from one another as a function of lift of the valve member to selectively block and establish communication between the space and the orifice, the second surfaces being formed at positions downstream of the respective first surfaces;

(g) the inner end of the orifice being formed within the nozzle body second surface and being closed directly by the valve member second surface when the valve member is in the unlifted position.

4,506,834
METHOD AND DEVICE FOR DISPERSING MATERIAL

Bo R. Ek, Stockholm, Sweden, assignor to Fiber Dynamics AB, Stockholm, Sweden

Continuation of Ser. No. 322,919, Nov. 19, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,566
Claims priority, application Sweden, Nov. 21, 1980, 8008196
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—1 5 Claims

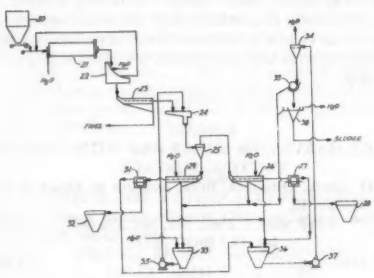


1. A method of increasing fiber separation in the flash drying of paper pulp comprising feeding a fibrous material into a nozzle having a converging inlet for a flowing medium, a feed inlet gap for the fibrous material and a diverging outlet, the feed inlet gap for the fibrous material opening into the nozzle adjacent but not upstream of the smallest cross-section of the nozzle, expanding the fibrous material together with the flowing medium in the diverging section of the nozzle to isentropic supersonic and sub-sonic flow; and supplying the expanded fibrous material and flowing medium to a flash dryer wherein the fibrous material is dried.

4,506,835
OIL SHALE BENEFICIATION

Shirley C. Tsai, Irvine, Calif., assignor to Occidental Research Corp., Los Angeles, Calif.

Continuation-in-part of Ser. No. 375,407, May 6, 1982, abandoned. This application Jun. 7, 1982, Ser. No. 386,201
Int. Cl.³ B02C *1/00*
U.S. Cl. 241—20 4 Claims

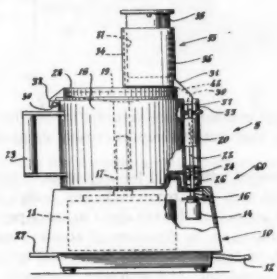


1. A process for oil shale beneficiation comprising:
comminuting oil shale capable of producing an average of at least about 15 gallons of shale oil per ton of oil shale to maximum particle size of about 0.75 inch;
removing at least a portion of comminuted oil shale having a particle size of less than about 100 mesh;
mixing the removed particles having a screen size of less than about 100 mesh with a two phase liquid mixture comprising a hydrocarbon liquid for agglomerating oil-rich oil shale particles in the hydrocarbon phase;
separating the agglomerates into a first oil shale product and refuse wherein the first oil shale product yield has been adjusted to maximize the separation efficiency index of the oil agglomeration separation; and
separating the remaining portion of the comminuted oil shale having a particle size greater than about 100 mesh into a second oil shale product and refuse by mixing the comminuted oil shale with a heavy medium having a specific gravity between the specific gravities of the second oil shale product and the refuse, the specific gravity of the heavy medium being sufficient to generate a second oil shale product yield of between about 30% and 60% which maximizes the separation efficiency index.

4,506,836
DUAL COVER AND FEED TUBE PROTECTOR ACTUATION APPARATUS FOR A FOOD PROCESSOR

James E. Williams, Stamford, Conn., assignor to Cuisinarts Research & Development, Inc., Greenwich, Conn.

Filed Dec. 20, 1982, Ser. No. 451,620
Int. Cl.³ B02C *18/16, 23/04*
U.S. Cl. 241—37.5 8 Claims



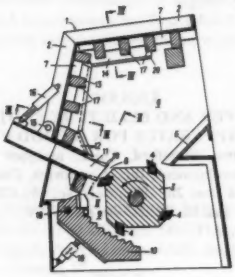
1. For use in a food processor of the type including a housing containing an electric motor drive and control means for rendering said electric motor drive inoperative unless said control means are actuated by a predetermined full amount, a bowl mountable on said housing in a proper position thereon, with a driveable member in the bowl with which various selected rotary tools can be engaged to be driven by said motor drive, a removable cover for said bowl adapted to be properly positioned on said bowl, a feed tube on said cover forming a food passageway for feeding food items through said cover into said bowl, and a feed tube protector adapted to be properly related with the feed tube for preventing inadvertent access to the food passageway when the drive is operative, dual actuation apparatus for said control means of the food processor comprising:
a first actuator on said cover for producing an initial portion of the predetermined full actuation of said control means,
a second actuator on said feed tube protector for providing a final portion of the predetermined full actuation of said control means, and
said first and second actuators being operatively associated in complementary relationship when the feed tube protector is properly related with the feed tube and the cover is properly positioned on the bowl properly mounted on the housing for providing both initial and final portions of full actuations of the control means for rendering the drive operative.

4,506,837

IMPACT CRUSHER

Hermann Schrödl, Gallspach, Austria, assignor to Fried.Krupp Gesellschaft mit beschraenkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,353
Claims priority, application Austria, Apr. 17, 1981, 1780/81
Int. Cl.³ B02C *13/31*
U.S. Cl. 241—97 8 Claims



1. An impact crusher which is useful for crushing materials such as stone, said material impact crusher comprising,

a housing,

a rotor mounted within said housing so as to rotate about a horizontal axis, said rotor including beater blades non-pivotally connected thereto about its outer periphery, said rotor defining in its direction of rotation an ascending quadrant, an upper, generally horizontal quadrant, a descending quadrant, and a lower, generally horizontal quadrant,

a delivery chute which extends into said housing so as to deliver material to be crushed toward said rotor at the area where said ascending quadrant intersects said upper, generally horizontal quadrant,

a plurality of rebound walls located within said housing, said rebound walls including a lower section which extends near said rotor at the area where said upper, generaly horizontal quadrant intersects said descending quadrant, thus forming a delivery opening therebetween, and

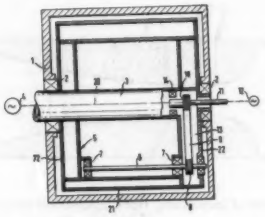
a plurality of separate elongated lower slipways which are associated with said lower section of said rebound walls and which extends into said delivery opening, each lower slipway defining a flat upper guideway surface which extends upwardly away from said delivery opening at an angle above horizontal such that an imaginary straight line extending along each flat upper guideway surface toward said delivery opening will intersect an imaginary plane which, at said delivery opening, is tangential to an imaginary circle defined by the rotating rotor at an obtuse angle, thus enabling pieces of material which are too large to pass through said delivery opening to move away from said delivery opening by sliding along the upper guideway surfaces of said slipways and thereafter be returned along said upper guideway surfaces to said delivery opening for contact with said beater blades, thus avoiding damage to said non-pivoting beater blades, said rotor and said lower slipways.

4,506,838

COMMINUTION AND MIXING APPARATUS

Hans Riniker, Rupperswil, and Walter Killer, 28, Bolleystrasse, 8006 Zürich, both of Switzerland, assignors to Walter Killer, Zürich, Switzerland

Filed Jan. 25, 1983, Ser. No. 460,777
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202308
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—98 22 Claims



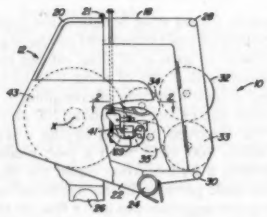
1. Comminution and mixing apparatus comprising a container for receiving material to be treated, said container having a side wall, first and second end walls and an axis; at least one drivable stirrer disposed within said container, said drivable stirrer having a drive shaft with an axis of rotation coaxial to said container axis, first and second arms extending radially away from said axis of rotation parallel to said first and second end walls of said container and a stirrer element interconnecting said arms and extending substantially parallel to said side wall; a rotatable material processing tool extending parallel to said stirrer element and having first and second ends; bearing means at each of said radially extending arms for supporting said first and second ends of said material processing tool; first drive means for rotating said drive shaft whereby to rotatably drive said stirrer element about said axis of rotation within said container at a first speed of rotation; second drive means for rotating said rotatable material processing tool at a second speed of rotation selectable independently of said first speed of rotation, said second drive means comprising a drive axle extending coaxially to said drive shaft and a transmission connecting said drive axle to said tool, wherein said second arm is hollow and wherein said transmission is located in said hollow second arm.

4,506,839

FORAGE HARVESTER SHEAR BAR WITH CONCAVE CUTTING SURFACE

Robert D. Black, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 7, 1982, Ser. No. 376,082
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—101.7 2 Claims



1. In a harvester including a cutter head mounted for rotation about a horizontal transverse axis and including a plurality

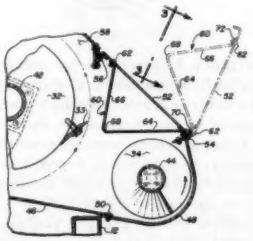
of cutting edges located for generating a cylinder when rotated about said axis, a transverse shear bar mounted adjacent to said cylinder at a location below a horizontal plane passing through the axis and being supported along its entire length in an arched condition wherein an upper surface thereof has a center located closer to said plane than are opposite ends, and a hard-faced cutting surface extending lengthwise of said cutter head and intersecting with said upper surface to form a shear bar cutting edge, the improvement comprising: said cutting surface being concave toward the cutter head and being perpendicular to said upper surface prior to being worn by usage in the harvester; and said shear bar cutting edge being spaced equally throughout its length from said cylinder.

4,506,840

BAFFLE MEANS FOR FORAGE HARVESTERS

Matthew V. Fagnani, Jr., and Wayne B. Martenas, both of New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 31, 1983, Ser. No. 528,015
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—101.7 **6 Claims**



1. In a forage harvester having a cutterhead for cutting and chopping crop material, and an auger for moving cut and chopped crop material away from said cutterhead, the improvement comprising:

baffle means located generally above said auger and behind said cutterhead to prevent crop material from being thrown from said auger toward said cutterhead; and

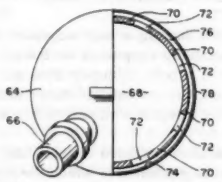
said baffle means including a substantially V-shaped member in cross-section having a pair of flat portions connected by a bight portion, one of said flat portions positioned to deflect crop material downwardly toward said auger, and said bight portion positioned to strip crop material from said cutterhead.

4,506,841

ARBOR FOR A STRIP ACCUMULATOR

Walter J. Hood, Shaker Heights, Ohio, assignor to Kent Corporation, Cleveland, Ohio

Filed Sep. 29, 1982, Ser. No. 428,131
Int. Cl.³ B65H *17/32, 17/48*
U.S. Cl. 242—55 **7 Claims**



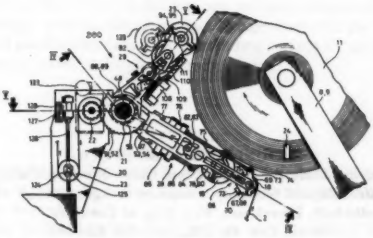
1. An arbor for a device which accumulates strip material comprising a hollow generally cylindrical member having a curved surface and closed ends, said curved surface including an outer plastic sheath, means to provide air under pressure to the inside of said hollow cylindrical member, a plurality of apertures in said plastic sheath, said apertures being arranged helically around the curved surface of said cylindrical member to permit air to pass therethrough to support the strip material as it passes thereover, a curved metallic cover underneath said plastic sheath, said cover having apertures therein aligned with the apertures in said sheath, and an inner curved body member spaced from said metallic cover and forming a plenum chamber with said metallic cover.

4,506,842

DEVICE FOR SPLICING A MOVING WEB TO A WEB OF A NEW ROLL

Heinrich Beck, Bussigny, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Oct. 12, 1983, Ser. No. 541,057
Claims priority, application Switzerland, Nov. 1, 1982, 6341/82
Int. Cl.³ B65H *19/10*
U.S. Cl. 242—58.3 **9 Claims**



1. In a device for forming a splice between a moving web from a finishing roll of material being delivered to a processing machine and an overlapping portion of a new web from a new roll of web material, said device comprising acceleration means to adjust the circumferential speed of the new roll to the linear speed of the moving web of the finishing roll; detection means for detecting an overlapping splicing area previously prepared on the new roll; pressure means for pressing the moving web against the outer surface of the new roll when the splicing area on the outer surface of the new roll passes by the pressure means; and cutting means for cutting the moving web being unwound from the finishing roll after formation of the splice with the new web of the new roll, the improvements comprising a support having a pair of spaced side members, a pair of tubular housings being keyed to a first axle, said housings being mounted for rotation in said side members with each housing extending past both surfaces of the side member, a first idler roller being mounted for rotation on said first axle betwen the side members; said acceleration means including an acceleration arm assembly having a pair of side elements interconnected at one end by a second axle extending transverse to said elements, said elements being mounted for rotation on the pair of tubular housings between the side members of the support, a subassembly including a second pair of arms mounted for pivotal movement on said second axle and having a roller axle at the opposite end, an acceleration roller keyed to the roller axle by axially adjustable means, means for rotating the subassembly on said second axle including a first pneumatic piston attached to the arm assembly having a rack engaging a pionion secured to one of the arms of the subframe, means disposed on the assembly for rotating the acceleration roll and means for rotating the acceleration arm assembly on said first axle including tooth sectors connected to each of the pair of side elements, said tooth sectors engaging pinions keyed on a drive shaft connected to a reduction motor connected to one of the side members of the support, said drive shaft rotatably supporting a

second idler roller; said pressure means including a pressure arm assembly including a pair of splicer arms rigidly mounted on the pair of housings outside of the side members, a third axle and a fourth axle extending between and transverse to said splicer arms with the fourth axle being at the ends of said splicer arm and the third axle being spaced inward of the fourth axle, a pair of short levers pivotably mounted on the third axle and rotatably supporting a pressure roller at one end, means for rotating the short lever arms including an actuator connected between one of the short lever arms and a splicer arm, a second reduction motor connected to the first axle for rotating the tubular housings in the side members with the pressure arm assembly moving therewith and a tension roller being supported for rotation on said fourth axle; and said cutter means including two knives mounted on a blade support, said blade support being mounted for pivotal movement on said fourth axle and having an arm, and a second pneumatic piston disposed between the arm and one of the splicer arms for pivoting said blade support.

4,506,843

DOUBLE-HOOKED SPOOL

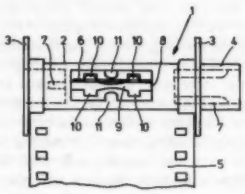
Hermann Lührig, Leverkusen, and Guido Kovacic, Unkel, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 434,746

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 8131086[U]

Int. Cl.³ G03B *17/26*

U.S. Cl. 242—74 **4 Claims**



1. A spool for photographic roll film, comprising a core of cylindrical shape,

a slot formed centrally in said core between at least a pair of outer bars extending parallel to the spool axis,

a central bar extending axially and positioned centrally in said slot,

at least two pairs of hook members formed on and spaced apart on said central bar

each pair of spaced apart hook members consisting of a pair of hooks arranged at 180° and diametrically positioned on the central bar

at least one holding-down member on each of the outer bars peripheral of the slot and positioned between the spaced hook members so that each holding down piece extends radially to a position between the hooks,

each holding down device having a film-directing surface forming an acute angle with the core radius

whereby film introduced into the slot is directable inwardly of the core in the axial center and with respect to the film edges so that the film is formable into a wave-like shape.

4,506,844

SAFETY BELT EMERGENCY LOCKING RETRACTOR

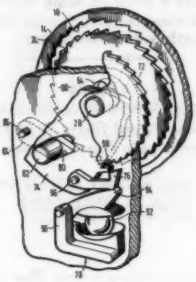
Hans-Hellmut Ernst, Sulfeld, Fed. Rep. of Germany, assignor to Britax-Kolb GmbH & Co., Fed. Rep. of Germany

Filed Nov. 15, 1983, Ser. No. 551,945

Claims priority, application United Kingdom, Nov. 20, 1982, 8233187

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **11 Claims**



1. An emergency locking retractor comprising a pair of mutually parallel frame members, a spool comprising a shaft for receiving a safety belt, a disc, having teeth on its periphery, mounted adjacent to each end of the shaft, complementary teeth on the frame members, bearings mounting the spool on the frame members so as to permit limited translational movement of the spool relative to the frame members in a direction perpendicular to the axis of rotation of the spool between a disengaged position and an engaged position in which said teeth of said discs engage with said complementary teeth on the frame members to inhibit rotation of the spool, resilient means being arranged to bias the spool into its disengaged position and actuating means being arranged to cause movement of the spool into its engaged position, wherein the tips of the teeth on the frame members are located on a circle centered on the axis of the spool when the latter is in its disengaged position, and the locking face of each tooth facing away from the plane in which the axis of the spool moves between its engaged position and its disengaged position is oriented, relative to the radial line from that tooth face to the axis of the spool when in its engaged position, at an angle which is the same as the angle between the locking face of each tooth of the discs and the corresponding radial line from each said tooth of the discs to the center of the disc.

4,506,845

TENSION LOCKING MECHANISM OF A RETRACTOR

Masahiro Tsukamoto, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,558

Claims priority, application Japan, Feb. 14, 1983, 58-18986[U]

Int. Cl.³ A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.7 **7 Claims**

1. In a retractor having a seat occupant restraining belt rolling-up reel rotatably supported on a base, a member for biasing said reel in a belt rolling-up direction and a tension locking mechanism, the mechanism comprising:

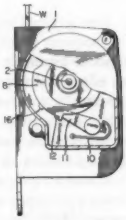
a locking portion integral with said reel so as to rotate with said reel;

an engaging member mounted on said base for movement between a locking position in which the engaging member is in engagement with said locking portion so as to prevent the reel rotation in the belt rolling-up direction and a non-locking position in which the engaging member is out of engagement with said locking portion so as to permit

the belt rolling-up reel rotation, said engaging member having a follower portion;

means for biasing said engaging member to the locking position;

a first cam member rotatable with said reel and having a first portion for keeping said engaging member in the locking position under a force of said biasing means during engagement between the first portion and said follower portion, a second portion for bringing said engaging member to the non-locking position from the locking position by engagement between the second portion and said follower portion when said reel rotates in a belt drawing-out direction, a third portion for holding said engaging member in the non-locking position during engagement between the third portion and said follower portion when said reel rotates in the belt drawing-out direction over a predetermined amount from a condition in which said follower portion engages with the first portion and a path



for guiding said follower portion from the third portion toward the first portion; and

a second cam member rotatable with said first cam member and adapted to be rotatable with respect to said first cam member between a first position opening said path and a second position closing said path, said second cam member having a guide portion for guiding said follower portion from said second portion to said third portion, means for engagement with said follower portion to bring the second cam member to the second position so as to guide the follower portion from said second portion to said third portion through the guide portion when the reel rotates in the belt drawing-out direction and means for engagement with said follower portion to bring the second cam member to the first position so as to guide the follower portion from said third portion toward said first portion through said path when the reel rotates in the belt rolling-up direction in a condition in which said follower portion engages with said third portion.

4,506,846

TAPE CASSETTE WITH SEPARATE TAPE GUIDE

Anthony L. Gelardi; John Gelardi, both of Cape Porpoise; Vincent Landry, and Diane Pruneau, both of Saco, all of Me., assignors to Shape Inc., Biddeford, Me.

Filed Jan. 6, 1984, Ser. No. 568,638

Int. Cl.³ G11B *15/32, 15/62, 23/08*

U.S. Cl. 242—199 **21 Claims**

1. A tape guide having a tape sliding surface for guiding tape through a tape cassette and along an external tape player/-recorder apparatus, comprising:

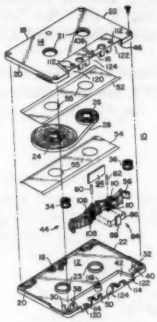
(a) an elongated bridge having

(i) a relatively planar top surface, a relatively planar bottom surface, a front, a back, a left end and a right end, wherein the planes of the top and bottom surfaces are substantially parallel to each other,

(ii) pin receiving means formed approximately at the center of the front of the bridge, and

(iii) a plurality of projections formed perpendicular relative to the planes of the top and bottom surfaces of the bridge on the left and right of the pin receiving means; and

(b) a first columnar pin and a second columnar pin positioned within the pin receiving means perpendicular rela-



tive to the planes of the top and bottom surfaces of the bridge, wherein the plurality of projections and the first and second pins define the tape sliding surface for the tape being guided through the tape cassette.

4,506,847

THERMALLING SAILPLANE TURN INDICATOR

Colin D. Norman, 23 Abdale St., North Wavell Heights, Queensland, Australia

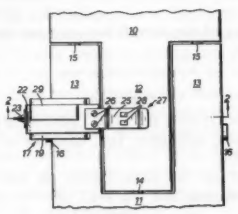
PCT No. PCT/AU82/00159, § 371 Date May 25, 1983, § 102(e) Date May 25, 1983, PCT Pub. No. WO83/01050, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 23, 1982, Ser. No. 499,148

Claims priority, application Australia, Sep. 25, 1981, PF0918

Int. Cl.³ B64C *31/02;* **G01M** *5/100*

U.S. Cl. 244—1 R **5 Claims**



1. Apparatus for indicating the entry of either of the removably mounted wings of a sailplane into a thermal and the direction of turn required in order to obtain lift from said thermal and comprising sensor means for detecting bending moments applied to a wing upon entry of said wing into a thermal, said sensor means providing an output when said plane enters a thermal, indicating means provided with said output for indicating the presence of a thermal and the direction to turn in order to enter said thermal, said sensor in use being mounted over juxtaposed wing stubs upon one of the removably mounted wings and comprising a rigid cantilevered or simply supported beam operatively removably connected to said one wing, said beam extending over a proximate region of the wing stub of the other wing, and a relative displacement detector supported on said beam and contacted with said other wing stub for detecting relative movement between said one wing and the wing stub of the other wing.

4,506,848

AIRCRAFT CONFIGURATION AND CONTROL ARRANGEMENT THEREFOR

James Fletcher, Preston, and Michael S. Wooding, Lytham St. Anne's, both of England, assignors to British Aerospace Public Limited Company, London, England

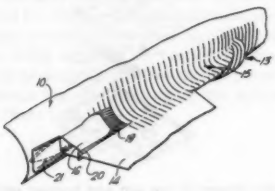
Filed Dec. 9, 1981, Ser. No. 329,131

Claims priority, application United Kingdom, Dec. 22, 1980, 8041043

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.³ B64C *15/02*

U.S. Cl. 244—12.4 **10 Claims**



1. An aircraft of at least one of the jet-propelled ve.tical and short take-off type including a body portion, wings carried by said body by means of twin intermediate portions lying one on each side of the body and blending with both the body and the respective wing, a gas turbine powerplant means housed within said body portion, twin movable jet propulsion outlet means arranged one aft each intermediate portion respectively, arranged to exhaust substantially all the propulsion fluid generated by the powerplant, each intermediate portion having an upper and lower surface diverging to a region of maximum thickness and each jet propulsion outlet means when in aft directed position being shaped to lie substantially within a rearward projection of maximum thickness, each outlet means being movable between a position in which it is aft directed and a position in which it is downwardly directed and each being located such that when it is downwardly directed its axis of thrust lies substantially within the same lateral plane as a first allowable extremity of the center of gravity, and trim jet means positioned beyond a second allowable extremity of the center of gravity and arranged to compensate for movement of the center of gravity of the aircraft between said first and second extremities.

4,506,849

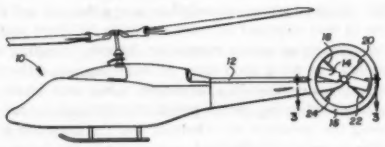
HELICOPTER ROTOR THRUST RING

Harold E. Lemont, Arlington, Tex., assignor to Textron, Inc., Providence, R.I.

Continuation of Ser. No. 134,871, Mar. 28, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 388,413

Int. Cl.³ B64C *27/82*

U.S. Cl. 244—17.21 **34 Claims**



1. Structure for enhancing the performance of a helicopter rotor, comprising:

a thin substantially planar annular airfoil having a chord of up to 0.25 of the rotor radius and a thickness of about 15% of the airfoil chord and a central opening with a diameter slightly greater than the diameter of the rotor; and

structure supporting said airfoil downstream from and coaxial with the rotor and in a plane essentially parallel to the plane of the rotor for capturing vortices produced in the wash of the rotor.

4,506,850

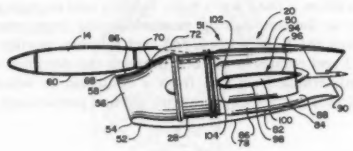
ENGINE INSTALLATION FOR AIRCRAFT

Charles H. McConnell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 4, 1983, Ser. No. 455,587

Int. Cl.³ B64C *3/32*; B64D *27/18*

U.S. Cl. 244—54 **9 Claims**



1. An engine installation assembly having a wing with a leading edge, a trailing edge, and upper aerodynamic surface, and lower aerodynamic surface extending from the leading edge to the trailing edge, and a rear main support structure adjacent said trailing edge, said assembly comprising:

a. a jet engine having a forward air compressing section, a rear turbine section, and an intermediate combustion section, said engine being positioned with the air compressing section located rearwardly of the rear main support structure of the wing,

b. a pair of mounting arms supported from, and extending rearwardly from, the rear main support structure on opposite sides of the engine, said mounting arms connecting to and supporting said engine,

c. a cowling structure surrounding said engine and having an exterior surface exposed to free stream air,

d. a primary air inlet section to receive free stream air and direct the air to the compressor section, said inlet section having a forward peripheral lip defining a main inlet opening of the inlet, said lip having an u.per lip portion spaced downwardly from the lower aerodynamic surface of the wing,

e. said inlet section and said cowling structure having an aerodynamically contoured upper forward surface portion spaced downwardly from the lower aerodynamic surface of the wing and defining with the lower surface of the wing a slot which extends between said mounting arms and which receives lower velocity boundary layer air adjacent the lower wing surface and directs that air over and upper exterior surface portion of said cowling structure.

4,506,851

DRAIN APPARATUS FOR AIRCRAFT

Alankar Gupta, Renton; Robert W. Jenny, Bellevue, and Frank L. Malone, Black Diamond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1981, Ser. No. 307,038

Int. Cl.³ F16K *31/122, 17/36*; B64C *1/00*

U.S. Cl. 244—129.1 **12 Claims**

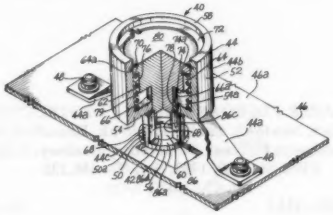
1. In an aircraft having a pressurizable compartment enclosed by an outer skin defining an outer surface exposed to atmospheric pressure and in interior surface exposed to compartment pressure, a self-cleaning drain apparatus comprising:

a drain opening through said outer skin;

a housing mounted to said interior surface of said outer skin and covering said drain opening, said housing including passage means defining a passage entrance opening flush with said interior surface and exposed to said compart-

ment pressure for allowing liquid to pass through said housing;

valve means mounted within said housing for movement between an open position and a closed position, said valve means blocking said passage means in said closed position to prevent fluid from passing through said drain opening;



means for automatically moving said valve means between said open and said closed positions in response to changes in the air pressure differential between said outer and interior surfaces of said outer skin caused by the pressurization or depressurization of said compartment; and

means for automatically clearing debris from said passage means and said drain opening in response to the movement of said valve means from said open to said closed position.

4,506,852

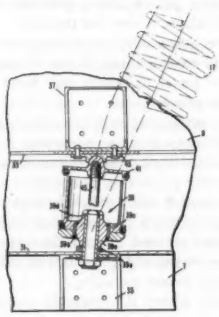
PAYLOAD DEPLOYMENT FROM LAUNCH VEHICLE USING CANTED SPRINGS FOR IMPARTING ANGULAR AND LINEAR VELOCITIES

Gerald J. Adams, Rancho Palos Verdes; William L. Burkett, Jr., Redondo Beach, and John V. Smolik, Granada Hills, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 131,309, Mar. 18, 1980, abandoned. This application May 18, 1982, Ser. No. 379,536

Int. Cl.[3] B64G *1/64*

U.S. Cl. 244—158 R **11 Claims**



1. Apparatus for the gyroscopic ejection of a payload from a payload carrier comprising:

a payload carrier;

a payload mounted on said payload carrier;

means releasably securing said payload to said payload carrier;

at least two compression springs compressed between said payload carrier and said payload in positions tilted from the perpendicular on opposite sides of said payload, to apply tangential components of spring compression force in the same rotational direction to said payload and components of spring compression thrust to said payload in the same direction parallel to the rotation axis of said payload; and

means supporting the ends of each of said springs to permit tilting of said springs to second angular positions when said payload is ejected;

whereby said springs are held in compression by said payload and when said means releasably securing said payload to said support structure releases said payload, said payload is rotated and ejected by said springs from said payload carrier.

4,506,853

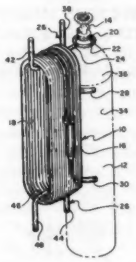
HOSE HOLDER

Kenneth M. Cathey, 249E Upland Ave., Absecon, N.J. 08201

Filed Dec. 27, 1982, Ser. No. 453,472

Int. Cl.[3] A62C *23/04*

U.S. Cl. 248—79 **9 Claims**



1. A hose holder for pressurized cylinders with top located valves comprising:

(a) a body member positioned essentially vertically along the side of the cylinder,

(b) a ring means structually attached and extending essentially horizontally from the body member to mount on the top of the cylinder, surrounding the valve and resting on the top of the cylinder,

(c) at least one support means connected to the body member below the ring means to rest against at least partially surrounds the outside side surface of the cylinder, and

(d) a hose holding means structurally attached to the body member to allow the pressurized hose to be hung on, and wherein the hose holding means comprises an upright "U" shaped upper member formed with or attached to an upper portion of the body member and an inverted "U" shaped lower member formed with or attached to a lower portion of the body member.

4,506,854

COLLAPSIBLE GOLF BAGS AND SUPPORTS THEREFOR

Hyoung J. Kim, 525 S. Lafayette Park Pl. #112, Los Angeles, Calif. 90057

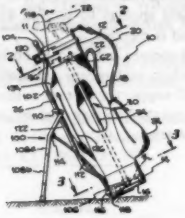
Filed Jan. 14, 1983, Ser. No. 458,157

Int. Cl.[3] A63B *55/00*

U.S. Cl. 248—96 **15 Claims**

1. A support assembly for a collapsible golf bag having an open top cuff, a closed bottom cuff and a pliable bag tube connecting said cuffs, said support assembly comprising a base slidable into said bottom cuff, said base being dimensioned and configured so as to be substantially restrained against lateral displacement within said bottom cuff without attachment to said bottom cuff, upper brace means extending across the inside of said upper cuff, and a relatively thin rigid support

shaft extending between said base and said upper brace means and substantially centered within said bag tube, said support



shaft urging said base against said bottom cuff to thereby support said top and bottom cuffs in spaced apart relationship.

4,506,855

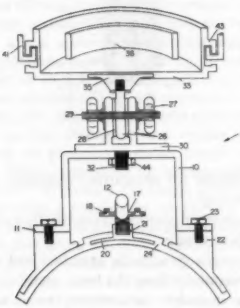
CURVED SURFACE SUCTION MOUNTING APPARATUS

Kirk E. McElhaney, 7123 S. Erie, #3014, Tulsa, Okla. 74136

Filed Jul. 16, 1982, Ser. No. 398,777

Int. Cl.³ F16B *47/00*

U.S. Cl. 248—206.2 **1 Claim**



1. Apparatus for holding articles of industrial utilization in fixed disposition relative to an elongated curved surface, comprising:

(a) a housing;

(b) a container holder carried on the housing, for securing a container of articles, said container holder including a clamping mechanism mounted for gripping a container of articles;

(c) a pivot mount attached to said housing and attached to said container holder for permitting the orientation of said container holder to be varied with respect to said housing;

(d) a diaphragm assembly carried on the housing, for placement against an elongated curved surface, said diaphragm assembly including;

(i) a curved backing plate structure having a centralized opening therein to the interior of the housing, and

(ii) a pad of pliable material disposed adjacent the baking plate and being of a configuration conforming to the periphery of the backing plate;

(e) a crankshaft carried in the housing for rotational movement upon manipulation, said crankshaft having a journal thereon;

(f) means for connecting the diaphragm pad to the crankshaft journal so that a portion of the diaphragm pad proximate the opening in the backing plate will be drawn upward upon rotation of the crankshaft, to create a suction force that urges the backing plate toward the curved surface; and

(g) means for holding the crankshaft in position to maintain the suction force.

4,506,856

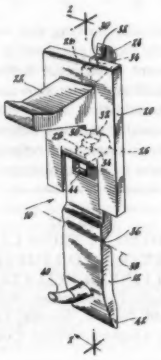
LOCKABLE PEGBOARD HOOK CONSTRUCTION

Michael Rich, Newtown, and F. Donald Ek, Brookfield, both of Conn., assignors to Tenax Corporation, Danbury, Conn.

Filed Mar. 30, 1983, Ser. No. 480,232

Int. Cl.³ E04G *5/06*

U.S. Cl. 248—222.1 **10 Claims**



1. A perforated panel hook construction adapted to overlie a first surface of a perforated panel having spaced horizontal and vertical apertures therethrough comprising:

a substantially planar shank portion, said shank portion including adjacent one end thereof:

at least one rearwardly projecting pin portion which is adapted to extend through one of said apertures in said perforated panel to attach said hook construction to a perforated panel,

a forwardly projecting support portion on said shank portion adapted to serve as a support for items to be supported by said hook construction on said perforated panel,

said rearwardly projecting pin portion not filling the aperture in said perforated panel through which it is inserted thereby providing a clearance opening therethrough, and

locking means secured to said shank portion to lock said hook in overlying engagement with said perforated panel, said locking means including,

a substantially planar downwardly extending locking flap mounted on said shank portion for pivotable movement about a hinge axis extending across the width of said shank, and

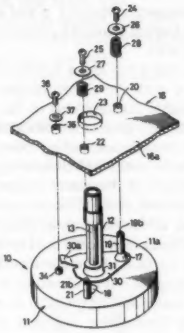
a generally perpendicular locking peg adjacent to the free end of said locking flap extending forwardly therefrom in the same direction as the support portion of said hook construction, said locking peg being adapted to be moved between an unlocked position remote from the aperture in said perforated panel receiving said rearwardly extending pin portion and a locked position in which said locking peg is received in snap-type engagement in the clearance opening of said perforated panel in an interference fit with said rearwardly extending pin portion.

4,506,857

ADJUSTABLE MOUNTING FOR A MOTOR ON A BASE

Takeo Hara, Inagi, and Seiji Ito, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 384,967
Claims priority, application Japan, Jun. 10, 1981, 56-85428[U]
Int. Cl.³ F16M *1/00*
U.S. Cl. 248—655 15 Claims



1. In combination with a motor for driving a tape along a predetermined path, said motor having a motor casing rotatably supporting a tape-driving motor shaft, and a plate-like base fixed relative to said path and having an opening therein: a device for mounting said motor on said base with said motor casing disposed beneath said base and said motor shaft extending upwardly and generally perpendicularly to said base through said opening therein so as to permit adjustment of the angular relation of the axis of said motor shaft in respect to said base, comprising

fulcrum-defining means extending from said motor casing and engageable with said base along a first straight line which is spaced from said axis of the motor shaft;

means for urging said fulcrum-defining means against said base so that said motor casing and shaft are angularly displaceable about said first straight line in respect to said base;

yieldable means for urging said motor casing and shaft angularly relative to said base in one direction about said first straight line;

threaded means on said motor casing at a location which is spaced, in a direction opposite to said first straight line, from a second straight line passing through said axis parallel to said first straight line and also spaced from said path; and

an adjusting screw received by said threaded means and engaging said base for adjustably determining the angular position to which said motor casing and shaft are urged relative to said base by said yieldable means.

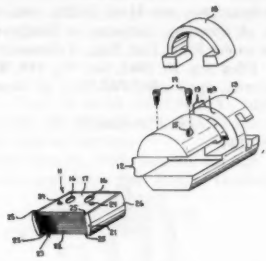
4,506,858

WIRELINE VALVE INNER SEAL

Ernest B. Gentry, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 31, 1983, Ser. No. 499,341
Int. Cl.³ E21B *33/06*
U.S. Cl. 251—1 A 12 Claims

1. An improved inner seal for a wireline valve ram, slidably attachable in a ram body, comprising: upper and lower rectangular retainer plates, each having tabs at both ends along one long edge, said edge being cut back more than a wireline radius almost all the way along forming said tabs, said plates being mold bonded to molded sealing means having a seal surface on



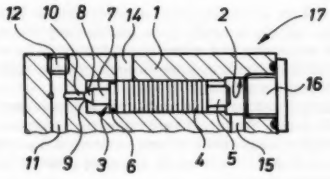
one side, said tabbed plate edges being bonded adjacent and parallel to said sealing means seal surface.

4,506,859

DEVICE FOR CONTROLLING A CONNECTION BETWEEN A PRESSURE MEDIUM SOURCE AND A FLUID SUPPLY CONTAINER IN A PRESSURE MEDIUM OPERATED SYSTEM

Hubertus Schmidt, Lohr, and Norbert Mucheyer, Rechtenbach, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 471,148
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209014; Nov. 23, 1982, 3243182
Int. Cl.³ F16K *31/143*
U.S. Cl. 251—63 8 Claims



1. A device for controlling a connection between a pressure medium source and a pressure medium supply container in a pressure medium operated system, comprising a control valve including a valve housing; a valve member having an axis, said valve member being axially displaceable in said housing by pressure of said medium, said housing having a valve seat, said valve member being formed with a piston and a seat portion projecting outwardly from said piston and facing said valve seat, said piston being of a diameter larger than a diameter of the valve seat, said housing being formed with a connection bore connected to the supply container and provided at the side of said piston facing towards said seat portion, said piston during its displacement controlling an opening and a closing of said bore, said valve member at the side thereof facing away from said seat portion being loaded with the pressure medium by selection; and a throttle means provided at a side of said piston facing toward said seat portion, said valve member being displaceable between two end positions, said seat portion abutting against said seat valve in one of said end positions, said piston limiting a pressure medium flow from said connection bore in a throttling manner, said housing in the region of said valve member at the side thereof facing from said seat portion being formed with an inlet bore for receiving pressure medium into said housing, said inlet bore being connected with the pressure medium source or the supply container by selection.

4,506,860

FLOW CONTROL VALVE, ESPECIALLY FOR USE IN CONTROLLING THE OPERATION OF STEAM TURBINES

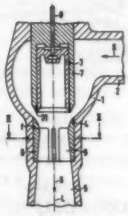
Otto von Schwerdtner, and Hans Judith, both of Muehlheim, Fed. Rep. of Germany, assignors to Kraftwork Union AG, Muhlheim an der Ruhr, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 419,787

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137710

Int. Cl.³ F16K *1/42*

U.S. Cl. 251—124 **9 Claims**



1. A flow control valve, especially for use in controlling the operation of steam turbines, comprising:

a valve housing having a valve seat and bounding a chamber situated upstream, and a difussing channel situated downstream, of said valve seat as considered in the direction of flow of a medium through the valve;

a valve member accomodated in said chamber and mounted on said valve housing for movement towards and away from said valve seat with attendant throttling of the flow of the medium between said valve member and said valve seat;

at least three projecting portions protruding at least substantially radially inwardly from said housing downstream of said valve seat and extending in the axial direction from the area of smallest flow-through cross section into the diffusing channel; and

a holding sleeve, wherein said projecting portions have free ends remote from said valve housing and extending substantially tangentially of and connected to said holding sleeve to hold the same in a coaxial position within said difussing channel.

4,506,861

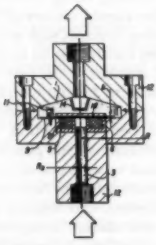
SERVO VALVE FOR ULTRA-FAST PRESSURE REGULATION WITH CONTROLLED SYSTEM DAMPING

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Filed Jan. 10, 1983, Ser. No. 456,718

Int. Cl.³ F16K *31/06*

U.S. Cl. 251—139 **10 Claims**



1. A pressure differential controlling servo valve wherein the pressure differential across the valve is a simple and smooth function of electric current, said valve comprising a housing having a centrally positioned inlet and an outlet, a ferrite electromagnet positioned within the housing in flow communication with the inlet, said ferrite electromagnet comprising a torroidal ferrite body with a core of coiled wire within said torroidal body, said wire core being potted in said torroidal body by a gasoline resistant substance, the central opening formed by the torroidal body surrounding the housing inlet, the ferrite electromagnet having a top and a bottom, the top of the electromagnet having a smooth planar surface perpendicular to the housing inlet,

a ferrite disk having a top and a bottom surface and sized to be coextensive with the electromagnet body, a magnetically impermeable film secured to the bottom surface of said ferrite disk and generally coextensive therewith, said film having a tongue extending outwardly beyond the edge of the ferrite disk, said disk being positioned on the top planar surface of the electromagnet with the film in confronting relation thereto, clamping means for securing the film tongue to the housing to hingedly retain the disk in position for back and forth movement with respect to the top planar surface of the electromagnet.

said housing having an outlet chamber in flow communication with the outlet and adapted to receive flow from the inlet when the ferrite disk is raised away from the top planar surface of the electromagnet, and whereby the fluid in the inlet passes between the film and the top planar surface of the electromagnet to provide a hydrostatic full film bearing so that the hydrostatic full film pressure forces balance the magnetic forces and thereby insures nonimpaired and smooth response to current flow into the electromagnet.

4,506,862

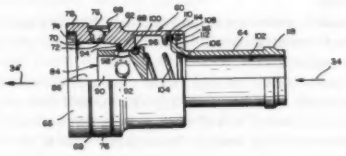
FLUID HOSE CONNECTORS

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Hauppauge, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,970

Int. Cl.³ F16L *29/00*

U.S. Cl. 251—149.5 **16 Claims**



1. A fluid hose connector comprising:

A. an elongated hollow body means having;

(i) a first body portion, including means for restraining lateral movement of a mating connector while encouraging quick disconnect capability, with

(a) a first internally disposed lip portion at one end, and

(b) a second internally disposed lip portion disposed proximate said one end;

(ii) a second body portion being separable from said first body portion and including,

(a) an externally disposed lip portion disposed at one end, and

(b) means for connection to a source of fluid at the other end;

(c) O-ring packing means disposed between said second lip portion and the lip portion of said second body portion;

(d) C-shaped retaining ring means disposed between said first body first lip portion and said second body lip

portion for removably retaining said second body portion within said first body portion;

B. hollow coupling means disposed within said first body portion for mating with and adapted to be movably retained by a mating connector;

C. hollow plunger means closed at one end, slidably received within said hollow coupling and said first body portion, said plunger means having a first disconnect position for preventing fluid flow and a second connect position for permitting fluid flow through said body; and

D. spring means disposed within said first body portion for urging said plunger means into said first disconnect position when said connector is not mated.

4,506,863

AUTOMATIC HYDRAULIC CONNECTORS

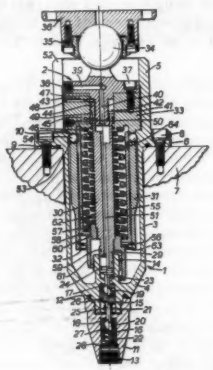
René A. Quin, Harskirchen, France; Paul Wiet, Randaberg, Norway, and Jean-Louis Migliarese-Caputi, Paris, France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 21, 1983, Ser. No. 564,065

Claims priority, application France, Dec. 22, 1982, 82 21525

Int. Cl.³ F16L *29/00, 37/28*

U.S. Cl. 251—149.9 **8 Claims**



1. An hydraulic connector for connecting an apparatus to an hydraulic pipe, comprising a first fixed part, means for connecting said first fixed part to the apparatus, first internal passage means provided in said first part and extending therethrough, a second retractable part having a first end and a second end, locking means carried by said second part for locking said second part to said first part, second internal passage means provided in said second part and having a first end at said first end of said second part and a second end at said second end of said second part, means for connecting said first end of said second passage means to the hydraulic pipe, said second end of said second passage means being adapted to be brought into communication with said first passage means, wherein said first part comprises a female cylindrical receptacle comprising an end piece provided with an axial neck directed inwardly of said receptacle and in part defining said first passage means, said second part comprises a hollow male cylindrical body for introduction into said receptacle, a cylindrical slide member is provided within said male body and is axially slidable therein, a main resilient member biasses said slide member in the direction of said second end of said second part and towards a locking position for locking said locking means, said male body comprises a movable hollow axial cylindrical core in part defining said second internal passage means and having a first axial end and a second axial end, fluid-tight engagement means provided at said second end of said movable core for engagement with said axial neck, an operating chamber associated with said first end of said movable core and adapted to receive operating fluid for causing axial displacement of said movable core in a disconnection direction from said second end of said second part towards the first end thereof, drive means provided on said second end of said movable core for driving said slide member, on displacement of said movable core in said disconnection direction, to cause said slide member to move from said locking position thereof.

4,506,864

VALVE SEAL ASSEMBLY

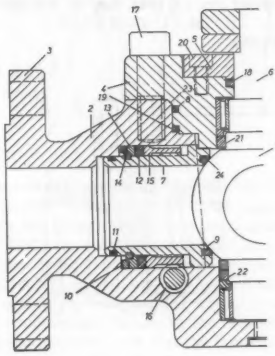
Werner Hartmann, Am Hütteberg 8, D-3167 Burgdorf-Ehlershausen, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 621,025

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321819

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—174 **2 Claims**



1. A valve comprising

(a) a valve housing having inner walls forming a cavity defining a passage for a fluid controlled by the valve;

(b) a movable spherical valve head supported in said cavity for controlling the flow of fluid through the passage;

(c) two valve seat sleeves having an axis and an external thread; said valve seat sleeves being axially slidably received in said cavity on diametrically opposite sides of said valve head; each said valve seat sleeve having an end face forming a seat for said valve head;

(d) a first sealing ring provided on said end face of each said valve seat sleeve; each said first sealing ring contacting said valve head;

(e) a separate force exerting means for axially urging each said valve seat sleeve toward said valve head;

(f) a separate seal assembly surrounding each said valve seat sleeve and including

(1) a second sealing ring being in circumferential engagement with said valve seat sleeve and a part of said inner walls of said valve housing; said second sealing ring having opposite, generally radial faces;

(2) a metal abutment ring surrounding said valve seat sleeve for abutting one of said radial faces to prevent an axial displacement of said second sealing ring in one direction relative to said valve seat sleeve;

(3) an internally threaded sleeve surrounding said valve seat sleeve and being in a threaded engagement therewith; said internally threaded sleeve having an annular part cooperating with the other radial face of said sealing ring; and

(g) separate force transmitting means for applying a torque to each said internally threaded sleeve in response to a force applied externally of the valve for rotating said internally threaded sleeve with respect to the valve seat sleeve to axially press said annular part of said internally threaded sleeve against said second sealing ring, whereby

said second sealing ring is axially pressed between said abutment ring and said internally threaded sleeve; each said force transmitting means including a worm gear extending circumferentially about each internally threaded sleeve and being in a torque-transmitting relationship therewith, and a worm screw supported in said valve housing and meshing with said worm gear.

4,506,865

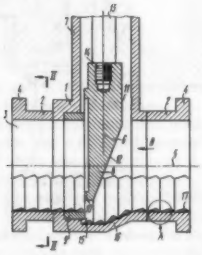
VALVE HOUSING

Boris F. Bragin, kvartal 50 let Oktyabrya, 52, 60; Petr V. Gladky, bulvar Davydova, 14, kv. 247, Felix D. Markuntovich, 10 mikroraion, 5, kv. 39, all of Voroshilovgrad; Evgeny F. Perepletchikov, ulitsa Suvorova, 34, Borispol Kievskoi oblasti; Isidor I. Frumin, Bolshaya Zhitomirskaya ulitsa, 17, kv. 6, Kiev, and Boris Y. Ekber, ulitsa Zoologicheskaya, 3, kv. 73, Moscow, all of U.S.S.R.

Filed Jan. 13, 1984, Ser. No. 570,369

Int. Cl.³ F16K *27/00*

U.S. Cl. 251—366 **4 Claims**



1. A valve housing for installation in a pipeline, having: butt pipes for connection to said pipeline for defining therewith a straight-flow passage for a flow of a fluid being conveyed; a plurality of ribs provided along the straight-flow passage on the lower portion of its wall, each passage extending substantially transversely of the straight-flow passage; each of said plurality of ribs having in a section taken through the longitudinal centerline of the straight-flow passage a tear-shaped configuration, the enlarged portion of the rib facing toward the incoming flow of a fluid being conveyed.

4,506,866

VEHICLE HOIST

Don M. Horn, P.O. Box 4050, Regina, Saskatchewan, Canada S4P 3R9

Filed Dec. 1, 1982, Ser. No. 446,077

Claims priority, application Canada, Jan. 5, 1982, 393581

Int. Cl.³ B66F *5/04*

U.S. Cl. 254—2 B **3 Claims**

1. A vehicle hoist of the type including

(a) a base disposed normally horizontally on the ground and having a first end portion and a second end portion;

(b) a column fixedly secured to the base and extending upwards therefrom at an inclination such that a bottom end of the column is secured to said base at a point relatively close to but spaced from said first end portion and a top end of said column is generally vertically above said first end portion;

(c) carriage means including a carriage disposed in said column for movement therein in the direction from one of said ends of the column to the other;

(d) first hydraulic power means operatively associated with said carriage means for selectively moving same along the column on actuation of manual control means;

(e) vehicle support means secured to said carriage and protruding from same in a direction away from that face of said column which is turned away from said first end portion;

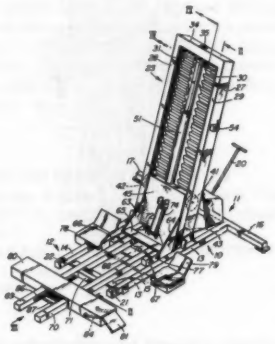
(f) mechanical lock means normally biased such as to prevent the movement of said carriage means in the direction from the top end to the bottom end of the column;

(g) manual lock release means independent of and distinct from said manual control means for actuating said lock means against its bias, the manual lock release means being of the type requiring a continuous manual force to maintain the lock means in released state; whereby an operator must use his both hands to initiate the descent of said carriage means and must maintain manual force on said lock release means throughout the descending of the carriage means;

(h) said lock release means being disposed at that face of said column which is turned away from the vehicle support means;

(i) said column being a structure of channel-shaped cross-sectional configuration comprising a generally solid bottom wall provided with a plurality of transverse locking protrusions, a pair of side walls extending along each side of the bottom wall, each side wall having a longitudinally inwardly turned flange forming guide means for said carriage, for guiding said carriage along the bottom walls;

(j) said carriage being provided with two transverse locking rods, one near an upper end of the carriage, the other near a lower end of the carriage, each locking rod being pro-



vided with spring means engaging a central portion of the respective rod and urging the respective locking rod into engagement with said locking protrusion such that said carriage is mechanically supported by said locking protrusions at two discrete locations near the upper end of the carriage and at two further discrete locations near the lower end thereof;

(k) said locking protrusions being disposed adjacent each other such that they form a wavy contour in cross-section, each protrusion including a locking surface generally perpendicular to the bottom wall and having a free end portion remote from said bottom wall and merging with a wedging surface extending from the free end portion downwards and then merging with the bottom wall immediately above the locking surface of the adjacent protrusion therebelow, whereby the movement of the carriage means upwards results in automatic release of the locking bar means in a ratchet-like fashion; and

(l) lock release bar extending along said bottom wall generally centrally thereof, said lock release bar being of a generally uniform, rectangular cross-section throughout its length and being so disposed that in an inoperative position one longer side of the rectangle generally coincides with said bottom wall while the opposite longer side of the rectangle is closely spaced from said locking rods when the latter are engaged with the respective locking surface, said lock release bar being pivotable about a

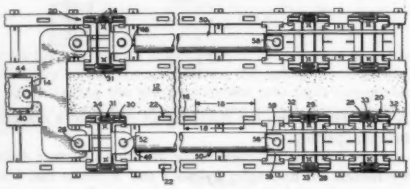
longitudinal axis and being provided with a handle for manually pivoting the release bar from the inoperative position to an operative position wherein one corner at said opposite longer side engages both said locking rods and forces them out of engagement with the respective locking protrusions.

4,506,867

JACKING APPARATUS HAVING A FAST REPOSITIONING STROKE

Michael J. LeGlue, New Orleans, La., assignor to McDermott Incorporated, New Orleans, La.

Filed Dec. 17, 1981, Ser. No. 331,737
Int. Cl.³ B66F *1/08*
U.S. Cl. 254—108 **7 Claims**



1. A jacking apparatus for effecting movement of a load in a direction along a member which has a plurality of anchor points spaced apart in said direction, the jacking apparatus comprising a group of at least two double-acting hydraulic cylinders including at least one first cylinder and at least one second cylinder arranged in tandem, an hydraulic fluid supply means to provide hydraulic fluid pressure at a predetermined flow rate to said group of hydraulic cylinders, a piston in each of said cylinders, the first cylinder piston has a first side and a second side, a piston rod portion connected to one of said pistons for transmitting force between said pistons and a load, another piston rod portion extending between said pistons, said second side of said first cylinder piston is free of attachment of any piston rod portion, means for routing hydraulic fluid to respective first sides of said pistons to apply hydraulic fluid pressure to said pistons in a first direction, means for routing substantially all of said predetermined flow rate of hydraulic fluid to said second side of said piston of said first cylinder to apply hydraulic fluid pressure to said first cylinder piston in a second direction, means for routing hydraulic fluid from said first side to said second side of said first cylinder piston while hydraulic fluid pressure is being applied to said first cylinder piston in said second direction, and at least one anchor point engagement means to engage an anchor point in the member for movement of a load when hydraulic fluid pressure is applied to said pistons in said first direction and to disengage an anchor point in the member for movement of said cylinders when hydraulic fluid pressure is applied to said first cylinder piston in said second direction.

4,506,868

SHOCK ABSORBER FOR VEHICULAR COUPLERS

Shoichi Shiroyama, Osaka; Kazuo Yamashita, Komaki, and Katsuji Morishita, Kasugai, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka and Tokai Rubber Industries, Ltd., Komaki, both of, Japan

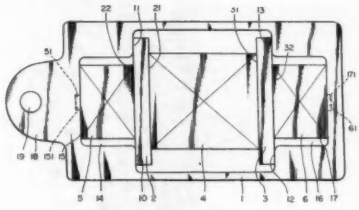
Filed May 27, 1983, Ser. No. 498,884
Int. Cl.³ F16F *9/30*; B61G *9/06*; B60G *11/22*
U.S. Cl. 267—3 **5 Claims**

1. A shock absorber for use with a coupler on a vehicle, comprising:

a shock absorbing frame having first and second opposed bottom walls formed therein and first and second pairs of opposed shoulders formed in said frame intermediate said bottom walls;

first and second follower plates movably mounted in said frame intermediate said first and second pairs of opposed shoulders, with said first follower plate being disposed against the first pair of shoulders of said shock absorbing frame and the second said follower plate being disposed against the second pair of shoulders thereof, said first follower plate being disposed to be contacted by a first part of the vehicle and urged toward the second pair of shoulders, said second follower plate being disposed to be contacted by a second part of the vehicle and urged toward the first pair of shoulders;

a main elastic member clamped under compression between said paired follower plates; and



first and second auxiliary elastic members, said first auxiliary elastic member being clamped under compression between the first bottom wall of said shock absorbing frame and said first follower plate and the second auxiliary elastic member being clamped under compression between said second bottom wall and said second follower plate, the compression of said first and second auxiliary elastic members substantially balancing the compression of the main elastic member, such that the first and second follower plates are disposed adjacent to but not forced against the first and second pairs of shoulders respectively.

4,506,869

DUAL CHAMBER SHOCK ABSORBERS FOR AIRCRAFTS AND THE LIKE

Jean Masclet, Paris, and Jacques Veaux, Chatillon, both of France, assignors to Messier-Hispano-Bugatti, Montrouge, France

Continuation of Ser. No. 282,641, Jul. 13, 1981, abandoned. This application Oct. 17, 1983, Ser. No. 542,094
Claims priority, application France, Aug. 29, 1980, 80 18732
Int. Cl.³ B60G *17/04*; B64C *25/60*; F16F *9/06, 9/43*
U.S. Cl. 267—64.15 **20 Claims**

1. A shock absorber comprising:

a cylinder having an open end and a closed end;

a hollow rod having a piston at one end slidable in said cylinder;

a first chamber in said rod;

a second chamber between said rod and said cylinder;

a third chamber in said cylinder between said piston and said closed end of said cylinder containing an incompressible fluid;

port means in said piston connecting said first and third chambers and said second and third chambers;

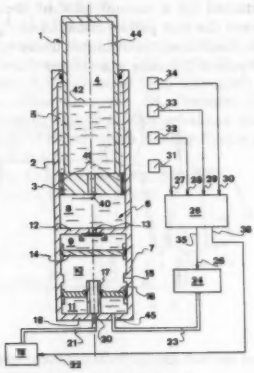
said third chamber comprising:

a first section defined by a transverse wall in said third chamber and by said piston, said transverse wall including pressure-relieving means;

a second section formed by said transverse wall and a separating piston slidable between said transverse wall and a projection in said cylinder located at the proximity of said closed end thereof;

a third section defined by said separating piston and a movable member slidable between said projection and said closed end of said cylinder; and

a fourth section between said movable member and said closed end, said fourth section including a nozzle extending from said closed end through said movable member for supplying a compressible fluid through said nozzle to said third section, and an orifice in said closed end for supplying an incompressible fluid therethrough thereby forming a jack chamber;



said first chamber containing first elastic means at a first given pressure;

said third section containing second elastic means at a second given pressure; and

said second elastic means being controlled by movement of said movable member according to at least one parameter corresponding to the performance of said shock absorber.

4,506,870

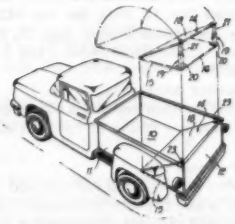
COMBINED TRUCK BED STORAGE COMPARTMENT AND SPOILER

William Penn, 1701 Nina St., Columbus, Ga. 31906

Filed Sep. 26, 1983, Ser. No. 535,811

Int. Cl.³ B62D *35/00*

U.S. Cl. 296—1 S **9 Claims**



1. A combined storage compartment and spoiler for a truck bed having a tailgate and substantially vertical side walls, said combined device comprising at least a hinged panel section on the floor of a truck bed and being adapted to assume an inclined position above the truck bed whereby the panel section forms a spoiler and simultaneously forms a top closure member for a storage compartment whose sides are formed by the truck bed side walls and whose rear wall is formed by the truck bed tailgate, means to releasably lock the panel section in said inclined position, and a bed plate hingedly connected with said panel section on a transverse axis hinge and adapted to rest on the floor of a truck bed, and said means to lock the panel section being secured to and rising from the bed plate near the rear end thereof.

4,506,871

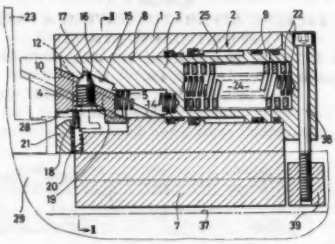
RETRACTING CLAMP

Keitaro Yonezawa, Itamishi, Japan, assignor to Aioi Seiki Kabushiki Kaisha, Itamishi, Japan

Filed May 10, 1983, Ser. No. 493,212

Int. Cl.³ B23Q *3/08*

U.S. Cl. 269—24 **8 Claims**



1. A retracting clamp for clamping an article to a machine structure comprising:

(a) a clamp housing attached to the machine structure defining therein an hydraulic cylinder and a piston rod bore extending from the hydraulic cylinder to a first end of the clamp housing;

(b) a piston slidably mounted in the hydraulic cylinder;

(c) a piston rod attached to the piston and extending through the piston rod bore, the piston rod defining a tapered slide face adjacent its distal end;

(d) hydraulic supply means to supply a pressurized hydraulic fluid to the hydraulic chamber such that the piston and piston rod are moveable between a retracted position and an extended position;

(e) clamp block means, and,

(f) attachment means to slidably attach the clamp block means to the tapered slide face of the piston rod and to slidably retain the clamp block in the clamp housing such that, during a first portion of the movement of the piston rod, the clamp block undergoes translational movement in a first direction and during a final portion of the movement of the piston rod, the clamp block undergoes translational movement in a second direction wherein the attachment means comprises:

(i) first stop means attached to the clamp housing and located so as to contact the clamp block at the end of the first portion of the piston rod movement;

(ii) a sliding groove defined in the tapered slide face of the piston rod;

(iii) a sliding guide formed on the clamp block and slidably retained in the sliding groove, so as to slidably attach the clamp block to the piston rod;

(iv) second stop means attached to the clamp block to limit its sliding movement relative to the tapered slide face of the piston rod; and,

(v) first spring biasing means interposed between the clamp block and the piston rod.

4,506,872

DEVICE FOR MOUNTING ACCESSORIES ON A PATIENT SUPPORT APPARATUS

Hans Westerberg, Tyresoe, and Enar Leandersson, Ekeroe, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,591

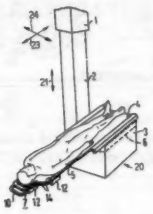
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236135

Int. Cl.³ A61G *13/00*

U.S. Cl. 269—322 **13 Claims**

1. A device for mounting accessories for a patient supporting apparatus having a frameless, x-ray permeable platform, said

device comprising a stirrup member having two lateral portions and having a shape matched to the exterior edge contour of a region of the platform to surround said region, said stirrup member having gripping means for engaging a portion of the edge of the platform, said stirrup having at least one mounting



track for providing a mounting base for accessories and having clamping means for connecting the lateral portions together and for urging the gripping means into tight engagement on the edge of the platform when the device is assembled on the platform.

4,506,873

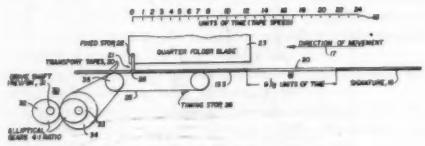
BRAKING MEANS FOR MOVING PAPER PRODUCTS ENTERING FOLDERS

Hans G. Faltin, 4135 Wilshire Dr., York, Pa. 17402

Filed Mar. 1, 1984, Ser. No. 585,181

Int. Cl.[3] **B42C** *1/00*

U.S. Cl. 270—46 **6 Claims**



1. The improved method of increasing the quarter folding speed of a sequence of signatures coming from high speed web pess folders, comprising the steps of,

conveying the signatures along a transit path in synchronous timing with gaps between successive signatures,

synchronously engaging the individual signatures by inserting a slow down stop moving at near the transit speed of the signatures along the transit path in said gaps between the signatures,

significantly reducing the speed of the moving signature by controlling the speed of the moving stop nonlinearly, and

stopping the signatures by striking a fixed stop at a quarter folding station when the signatures are travelling at a significantly reduced speed.

4,506,874

PILE PRESSING DEVICE

Roland Preisig, Yens, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

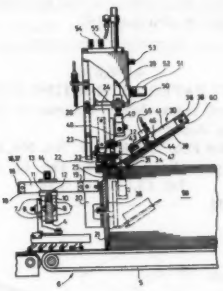
Filed May 24, 1983, Ser. No. 497,412

Claims priority, application Switzerland, Jun. 1, 1982, 3353/82

Int. Cl.[3] **B65H** *3/04, 3/54*

U.S. Cl. 271—35 **4 Claims**

1. A device for pressing a pile of sheets in a feeding station, said feeding station having conveyor means with continuous belts for transporting a bottom sheet in a pile of sheets and means for preventing passage of more than one sheet at a time from the bottom of the pile, said means including a gauge with a lower edge, support means including a support member for mounting the gauge in the feeding station with the lower edge spaced above the surface of the belt of the conveyor by the required distance, said device comprising a pressing carriage; a vertical path defined by at least one vertically extending rail mounted on the support member and a vertically extending groove on a surface of the gauge, said carriage having slide elements engaging the groove in each rail to guide the carriage along the vertical path; a pressing device mounted on said carriage including an infeed guide with an aperture; sensing means for determining contact with a batch of sheets being introduced to the pile including a switch mounted in said aperture of the infeed guide, a sensing plate and means for mounting the sensing plate on the infeed guide for pivotal



movement into and out of contact with the switch; and drive means for moving the carriage along the vertical path including a pneumatic piston mounted on a support having a piston rod attached to the infeed guide, control means including setting means for adjusting the pressing force of the pressing unit, drive means for commanding the vertical shifting and central means for checking the elevation and lowering speeds as the pneumatic fluid is applied to the piston so that the pressing device maintains a constant pressure on the stack in the feeding station and, when adding an additional batch of sheets to the pile, the sensing means is tripped causing a retraction of the pressing device to provide clearance for inserting of the batch of sheets onto the pile.

4,506,875

SUCTION-BOX FEED DEVICE

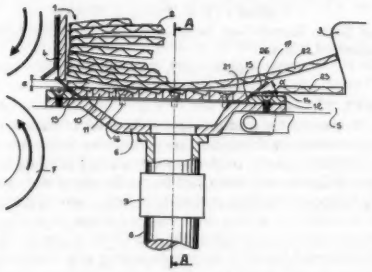
Bernard Capdebosco, St Just Chaleyssin, and Jean-Luc Mion, St Victor de Cessieu, both of France, assignors to S. A. Martin, Villeurbanne, France

Filed Dec. 23, 1982, Ser. No. 452,478

Claims priority, application France, Feb. 19, 1982, 82 02907

Int. Cl.[3] **B65H** *3/08*

U.S. Cl. 271—99 **4 Claims**



1. A feed device for supplying sheets to a processing ma-

chine in which each sheet is fed from the bottom of a stack (2) delimited by a down stream abutment (4), comprising

(a) at least one suction box (6) driven in a longitudinal to-and-fro movement and provided with a suction plate (10);

(b) at least one frame (17), made of flexible material, surrounding said suction plate (10) so as to form with it a hollow suction cup fixed in vertical position and having flexible edges (26) located above the upper level (21) of said plate (10) in the absence of a said sheet being sucked up, i.e., when said edges are raised, and located in alignment with or below said plate (10) when a sheet (22, 23) is sucked up, i.e., when said edges are turned down;

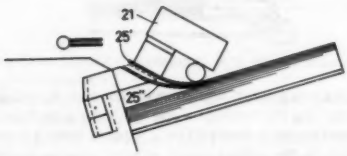
(c) said device being so dimensioned and arranged that a leading edge of said flexible frame (17) does not move, in the most retracted position of said suction box (6), beyond said downstream abutment (4).

4,506,876

SHEET PAPER ATTRACTING SYSTEM

Toshiki Nishibori, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1983, Ser. No. 464,378
Claims priority, application Japan, Feb. 13, 1982, 57-21570
Int. Cl.³ B65H *3/34*
U.S. Cl. 271—104 **10 Claims**



1. A paper sheet supplying system wherein individual sheets of paper are sequentially removed from a stack of sheets which comprises

a paper sheet attracting unit including a suction air casing for separating a paper sheet from the top of a stack of sheets,

a piled sheet feeding preventing means containing a suction air casing for attracting a single paper sheet,

location control means for locating said piled sheet feeding preventing means at a position confronting said paper sheet attracting unit at any desired time,

detection means for detecting whether more than one sheet is separated from the stack of sheets by the paper attracting unit, whereby said additional sheet or sheets are separated from the top sheet, and

means for returning the additional sheet or sheets which have been separated from the top sheet back to the stack of sheets.

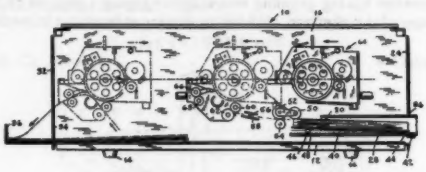
4,506,877

AUTOMATIC BIASING MECHANISM FOR PAPER CASSETTE SUPPORT PLATE

Oded Sagiv, Ramat-Gan, Israel, assignor to Savin Corporation, Stamford, Conn.

Filed Aug. 4, 1982, Ser. No. 405,183
Int. Cl.³ B65H *1/08*
U.S. Cl. 271—127 **6 Claims**

1. Apparatus for positioning the top sheet of a stack of sheets at a predetermined location on a machine frame adapted removably to receive a stack-supporting tray including in combination, a frame, means on said frame for removably receiving a stack-supporting tray, means including a pair of interengageable elements for acting on a stack of sheets in a tray on said receiving means to position the top sheet of the stack at said predetermined location, means mounting said interengageable elements on said frame for relative movement between a disengaged position on said frame and an engaged position on said frame, means for biasing said elements to said disengaged position on said frame in the absence of said tray on said supporting means and means responsive to positioning of a stack-



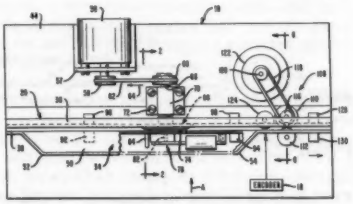
supporting tray on said receiving means for moving said elements to said engaged position against the action of said biasing means.

4,506,878

DUAL DIRECTIONAL DOCUMENT DRIVE APPARATUS

Anthony J. Bashford, Baden, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 28, 1982, Ser. No. 392,481
Int. Cl.³ B65H *7/02*
U.S. Cl. 271—227 **5 Claims**



1. A sheet moving apparatus comprising:

a track having first and second spaced side walls and a third wall therebetween to form a sheet receiving space therebetween; and

means for moving a sheet substantially towards said third wall and thereafter moving said sheet in a downstream direction along said track, comprising:

a rotatable member having an axis of rotation and also having a surface positioned in said sheet receiving space;

means enabling said rotatable member and its surface to be rotated so that said surface is parallel to said first and second spaced walls and said axis of rotation is perpendicular thereto;

a moveable member and means enabling said moveable member to pivot between first and second positions with regard to said rotatable member;

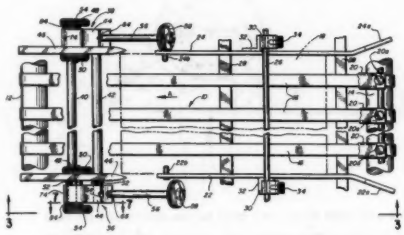
said moveable member having an engaging member to cooperate with said surface to said rotatable member to move a sheet towards said third wall when said moveable member is in said first position and said rotatable member and its surface are rotated, and said engaging member of said moveable member being enabled to cooperate with said surface of said rotatable member to move said sheet in said downstream direction when said moveable member is pivoted to said second position and said rotatable member and its surface are rotated; and

drive means for pivoting said moveable member between said first and second positions.

4,506,879
SHEET REGISTERING MECHANISM

Eber L. Goodwin, Arlington Heights, and James E. L. Zeigler, Cary, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Nov. 2, 1982, Ser. No. 438,557
Int. Cl.³ B65H 9/00
U.S. Cl. 271—238 16 Claims



1. In a printing machine or the like which includes a sheet conveyor board, a fixed support extending laterally of the conveyor board, and a reciprocating jogger device extending laterally of the conveyor board, a sheet registering mechanism which can be selectively changed to jog sheets from either side of the conveyor board comprising:

a pair of support frames one mounted at each side of the conveyor board and engageable with both said fixed support and said jogger device;

locking means on each support frame and selectively lockable with either the fixed support or the jogger device to form either a stop guide means or a pusher guide means, respectively;

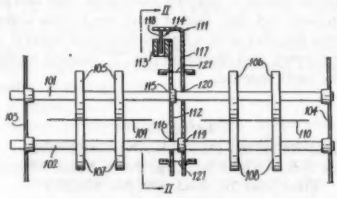
spring loaded movable means on each support frame for acting against a side edge of a sheet; and

means on each support frame operatively associated with the respective spring loaded movable means for selectively rendering the spring action thereof inoperative.

4,506,880
SHEET HANDLING MACHINES

Christopher J. Dixon, Buckhamshire, and Stuart M. Jenkins, Sussex, both of England, assignors to De La Rue Systems Limited, London, England

PCT No. PCT/GB81/00264, § 371 Date Aug. 6, 1982, § 102(e) Date Aug. 6, 1982, PCT Pub. No. WO82/02037, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 8, 1981, Ser. No. 509,463
Claims priority, application United Kingdom, Dec. 8, 1980, 8039232
Int. Cl.³ B65H 7/12
U.S. Cl. 271—263 10 Claims

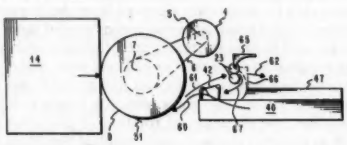


1. A sheet handling machine comprising: first (101) and second (102) parallel rotatable shafts mounted between fixed sided frame members (103, 104); first (105) and second (107) rollers carried by the first and second rotatable shafts respectively, the rollers mating to form a nip therebetween; sheet thickness detecting apparatus comprising a transducer (114, FIG. 1; 4, FIG. 3A) having first (113) and second (118) relatively movable parts, the relative movement of which results in a transducer output signal, the first and second parts being so mounted in the apparatus that the passage of a sheet between the rollers results in a signal indicative of sheet thickness, and a control circuit (FIG. 3A, FIG. 3B) which compares the thickness signal with at least one stored threshold level signal (TP1, TP2) to provide an output signal (31, 32, 33) indicating whether the detected thickness corresponds to a single sheet or multiple sheets (109); wherein each of the first and second shafts is flexible and thus deflectable by the passage of sheets between the rollers, and wherein the first and second parts of the transducer are mounted on middle portions of the first and second rotatable shafts respectively, whereby the relative motion of the rotatable shafts is conveyed directly to the transducer.

4,506,881
DUPLEXING PAPER HANDLING SYSTEM

Ronald E. Hunt, Georgetown, and William M. Jenkins, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,704
Int. Cl.³ B65H 5/06
U.S. Cl. 271—277 6 Claims



1. In a paper handling system wherein a drum, rotatable in first and second directions retains a sheet of paper for printing or scanning on a first side of said paper, said system including exit roller means for engaging an edge of said sheet exiting said drum to remove said sheet to a stacking area during a portion of rotation of said drum in said first direction, the improvement for duplexing said paper on said drum for printing on a second side of said paper, comprising:

means for interposing a duplexing deflector in a path of said paper between said drum and said stacking area for inhibiting a first edge of said paper first exiting said drum from entry into said stacking area and causing said first edge to be thereafter clamped to said drum, whereby said second side of said paper is exposed for printing or scanning;

latching means activated by rotation of said drum in said second direction after said exit roller means have engaged said paper, for activating said means for interposing said duplexing deflector; and

means upon activation of said latching means and after said exit roller means have engaged said paper for causing relative movement between said drum and said exit roller means to pull said sheet of paper out of a first retention by said drum.

4,506,882

DEVICE FOR PLACING BANKNOTES WITH THEIR FRONT OR REVERSE SIDES FACING IN THE SAME DIRECTION

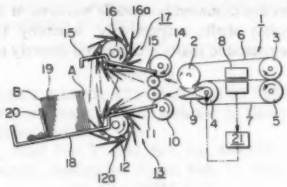
Yukio Ito, Fujisawa, and Yoshihiro Koshio, Odawara, both of Japan, assignors to Musashi Co., Ltd., Tokyo and Hitachi Engineering Kabushiki Kaisha, Kanagawa, both of, Japan

Filed Dec. 14, 1982, Ser. No. 449,657

Claims priority, application Japan, Dec. 21, 1981, 56-189369[U]

Int. Cl.³ B65H *29/00*

U.S. Cl. 271—303 2 Claims



1. A device for placing banknotes in a stacker with their front or reverse sides facing in the same direction, said stacker having an open end for receiving said banknotes, said device comprising a substantially horizontal transfer unit adapted for transferring the banknotes, a checking unit for sensing whether the banknotes are being supplied through said transfer unit with their front sides facing upwards or their reverse sides facing upwards, route selecting means provided on an exit side of said transfer unit and capable of being rotated alternately between a first position thereof and a second position thereof above said first position in response to respective front-side signals and reverse-side signals received from said checking unit, and a pair of vane wheels consisting of an upper vane wheel and a lower vane wheel, said lower vane wheel being disposed adjacent to said stacker open end, and said vane wheels rotating in mutually opposite directions for respectively conveying the banknotes received from the respective of said positions of said route selecting means to said open end of said stacker, said banknotes transferred through said transfer unit being supplied to said lower one of said vane wheels when said route selecting means is in its said first position and to said upper vane wheel when said route selecting means is in its said second position, the direction of rotation of said lower vane being such as to direct the banknotes supplied thereto into said stacker with their front sides facing in one direction, and said opposite direction of rotation of said upper vane wheel directing the banknotes supplied thereto towards said stacker with their front sides facing in said direction.

4,506,883

HARNESS APPARATUS AND METHOD FOR BREATHING EXERCISES

Ethan M. Rathbun, Colorado Springs, Colo., assignor to William A. Dye, Colorado Springs, Colo., a part interest

Filed Feb. 7, 1983, Ser. No. 464,644

Int. Cl.³ A01B *23/00*

U.S. Cl. 272—99 19 Claims

1. A training harness adapted for use by a person as an aid in breathing exercises, comprising:

a first flexible strap adapted to extend around the upper torso region of the human body and having first fastening means on its free ends, said first fastening means for releasably and adjustably interconnecting the free ends of said first flexible strap to define a first closed loop of selectably variable circumferential length;

a second flexible strap adapted to extend around the lower torso region of the human body and having second fastening means on its free ends, said second fastening means for releasably and adjustably interconnecting the free ends of said second flexible strap to define a second closed loop of selectably variable circumferential length; and

relatively stiff, resilient support means interconnecting said first and second flexible straps for maintaining said first

and second support straps in a normal state of spaced-apart relation to one another while permitting resilient deflection of said first and second flexible straps toward one another.

4,506,884

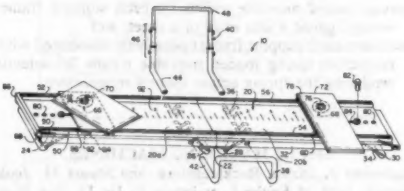
BODY STRETCHER SYSTEM

Stuart M. Hankin, Apt. 1-J, 3018 Fallstaff Manor Ct., Baltimore, Md. 21209

Filed Mar. 3, 1983, Ser. No. 471,886

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—127 5 Claims



1. A system for stretching muscles and tendons and ligaments of the human body, comprising a base, said base being rectangular with sides and ends, a pair of tracks along the base, a pair of carts, means movably engaging the carts with the tracks, each cart having a pivotal platform thereon, at least one handle laterally engageable with the base along a mid-portion of a side of the base, each of said pivotal platforms proportioned for receiving a nominal size human knee and shin thereon, said carts movable along said tracks a distance providing for extreme flexing of muscles associated with said nominal size human knee and shin, said at least one handle comprising a "T"-shaped member with a lateral extension portion along a lower part thereof, and means on the "T"-shaped member for drawing the carts together.

4,506,885

EXERCISING DEVICE AND METHOD

Ernest P. de Wet, 6 Alpha St., Cape Town, South Africa (7700)

Filed May 20, 1983, Ser. No. 496,533

Claims priority, application South Africa, Jul. 2, 1982, 82/4751

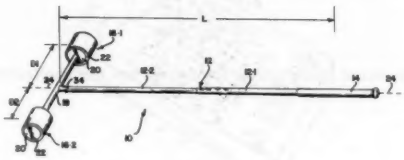
Int. Cl.³ A63B *21/22, 23/02*

U.S. Cl. 272—128 4 Claims

1. An exercising device which comprises:

a light-weight shank defining an elongate, longitudinally extending hand grip at one end thereof; and

a pair of massy heads at the other end of the shank, the heads being spaced from, and disposed on opposite sides of, an imaginary axis coinciding with the longitudinal direction of the hand grip, and being connected to one another and to the shank by a light-weight connecting structure, whereby a person, in doing body exercises with the device, can hold the device by means of said hand grip, swing the device so that the heads move in repeated cycles around the person's body, and impart a spin momen-



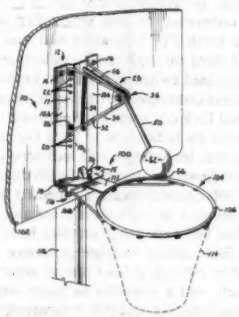
tum to the heads about said axis each time the heads pass in front of the person, the connecting structure being a thin rod-like portion with said massy heads of substantially larger diameter then said connecting structure, being disposed at opposite ends of the connecting structure, the combined mass of said heads being in the order of about 2 kg and being substantially greater than the mass of the shank and the connecting structure, and the moment of inertia of one of said heads about said axis being substantially greater than that of said other head.

4,506,886

BASKETBALL PRACTICE APPARATUS

Don Q. Lamb, Sr., 819 Humboldt St., Manhattan, Kans. 66502

Filed Apr. 2, 1984, Ser. No. 595,711
Int. Cl.[3] A63B *63/08*
U.S. Cl. 273—1.5 A **9 Claims**



1. In combination with a basketball goal assembly including a rim, a backboard, means for affixing said rim to said backboard in a normal relationship therebetween, a device for improving a player's accuracy in shooting a basketball into said goal comprising:

a target;

means for mounting said target above said rim in pivotal movement between two modes of operation with said first mode relatively aligning said target with a vertical centerline normally extending through the plane of said rim and a second mode displacing said target away from said centerline, said target mounting means comprises:

a bracket member having first and second ends;

a pivot assembly at said second end of said bracket member and presenting a horizontal axis therein;

a boom having first and second ends;

means for releasably mounting said bracket member to said backboard with said pivot assembly generally extending above said plane of said rim;

means for mounting said boom member in swingable movement about said horizontal axis of said pivot assembly; and

means for fastening said target to said second end of said boom;

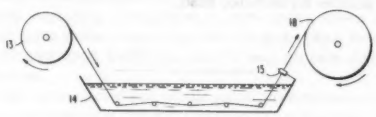
bias means for urging said second end of said boom towards said centerline for an intersection therewith and said target into said first mode so that said target is positioned in a desired curvilinear path of a shot basketball between said shooter and said goal, said basketball traveling through said path contacting said target in a relationship which overcomes said bias and urges said target into said second mode to allow passage of said shot basketball through said underlying goal whereby said target urges said shooter to direct said basketball along said path.

4,506,887

RACKET FRAME COMPRISED OF A SINGLE CONTINUOUS FILAMENT AND RESIN

Stanley Trysinsky, 3-10720-97th St., Edmonton, Alberta, Canada (T5H 2L8)

Continuation-in-part of Ser. No. 776,698, Mar. 11, 1977, abandoned, which is a division of Ser. No. 143,567, May 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 1,991, Jan. 13, 1970, abandoned, which is a continuation of Ser. No. 599,355, Dec. 2, 1966, abandoned. This application Aug. 24, 1981, Ser. No. 295,289
Int. Cl.[3] A63B *49/10*
U.S. Cl. 273—73 F **6 Claims**



1. A racket frame comprising comprising a handle portion, a throat portion and a head, said handle portion, throat portion and head being integral and consisting essentially of thermosetting resin means reinforced with a single continuous filament means disposed in a plurality of windings which are arranged parallel to each other under tension and which extend along said handle portion, around the entire circumference of the head and back along said handle portion to define a hollow handle, said single continuous filament means having two ends secured together and including a throat piece comprised of a rigid plastic insert surrounded completely on each side by said continuous filament means with the opposed faces covered by a mat of filaments disposed substantially parallel to the filament means defining said handle.

4,506,888

GOLF PUTTER WITH INTERCHANGEABLE SHAFTS AND HEADS

Michael Nardozzi, Jr., 255 Richland Dr., Pittsburgh, Pa. 15235

Filed Apr. 11, 1983, Ser. No. 483,518
Int. Cl.[3] A63B *53/02, 53/06*
U.S. Cl. 273—80.1 **10 Claims**

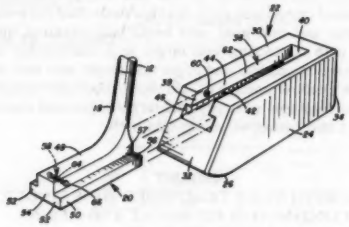
1. A golf club having interchangeable head and shaft portions comprising:

a club shaft having a longitudinal axis and a lower end portion, said lower end portion including a shoulder,

a club head having a body portion with a striking face on one side thereof, said body portion having opposite end portions formed by a toe at one end and a heel at an opposite end, said striking face extending from said toe to said heel,

a guideway extending in said club head parallel to the plane of said striking face from said toe to said heel spaced behind said striking face and along the length thereof,

said guideway being open at said toe to form an entry into said guideway at said toe, said guideway being closed adjacent said heel to form a stop spaced from said entry, said shoulder on said shaft lower end portion being received through said entry and slidable in said guideway from said toe to said heel to a fixed position abutting said stop to mount said club head on said shaft at an angle relative to said shaft longitudinal axis so that when said club shaft is



swung a force is applied to said shaft lower end portion to maintain said shoulder abutting said stop, and

interconnecting means carried on said club shaft lower end portion and on said club head within said guideway for releasably securing said club head to said club shaft when said shoulder abuts said stop to permit selected removal of said club head and replacement of another on said club shaft and removal of said club shaft and replacement of another on said club head.

4,506,889

PROTECTIVE DEVICE

John J. Lewis, 2439 Prospect, Evanston, Ill. 60201

Filed Jan. 16, 1984, Ser. No. 571,235
Int. Cl.³ F41B *15/00*
U.S. Cl. 273—84 R **23 Claims**

1. A device used for bodily protection against another, said device comprising:

a hollow cylindrical housing means;

a closed loop member whose strands are interlooped with said housing means at one end thereof and having an engaging portion which the user engages to distend the member from the housing in a form such that the strands extend outwardly from said housing means in a generally parallel orientation relative to each other for defensive use; and

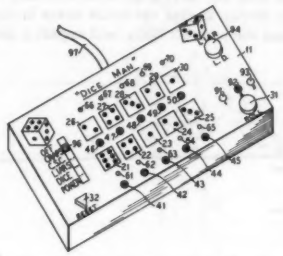
releasable closure means arranged at the other end of said housing means and being operatively connected to said loop member.

4,506,890

ELECTRONIC DICE GAME

Edward J. Murry, 9223 W. 119th St., Palos Park, Ill. 60464

Filed Jan. 17, 1983, Ser. No. 458,549
Int. Cl.³ A63F *9/04*
U.S. Cl. 273—138 A **2 Claims**



1. An electronic dice game comprising a first console with a first die which has at least seven PIP indicators, a first random voltage generator which generates random voltages with a plurality of outputs connected to said seven PIP indicators, and a roll switch connected to said first random voltage generator to energize it when said roll switch is actuated, wherein said roll switch causes said seven PIP indicators to be randomly illuminated to different indications when it is depressed and some of said seven PIP indicators continue to be illuminated when said roll switch is released, including at least a second die which has seven PIP indicators, a second random voltage generator with a plurality of outputs connected to said seven PIP indicators of said second die, and said roll switch connected to said second random generator to energize it when said switch is actuated, including eight additional dice each of which have seven PIP indicators, third through tenth random voltage generators each with a plurality of outputs respectively connected to said seven PIP indicators of said third through tenth PIP indicators and said roll switch connected to said third through tenth random generators to energize them when said switch is actuated, including one or more lock out switches connected to one or more of said dice so that when a selected lock out switch is depressed the associated die does not change its indication at least the next time the roll switch is actuated, including a roll indicator connected to said roll switch to indicate the number of rolls during a single game, comprising a roll counter means connected to said roll switch to count the number of rolls after reset and to prevent additional rolls after the authorized number have been rolled, and wherein said first random voltage generator comprises a plurality of flip-flop circuits at least one of which is connected to said roll switch, and a plurality of gates connected between said flip-flop circuits and said PIP indicators, a second console similar to said first console, a game selector switch on said first or second console to allow particular games to be selected such that said game selector switch controls said roll indicator and said roll counter so that the conditions for the selected game are set.

4,506,891

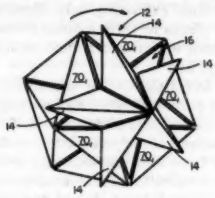
GEOMETRIC DEVICE

Adam Alexander, 57 Second Ave., New York, N.Y. 10003, and Gary Piaget, 5 Ridley Ct., Glenridge, N.J. 07028

Filed Mar. 29, 1982, Ser. No. 362,763
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **11 Claims**

11. A shiftable element device comprising a plurality of surface elements dimensioned and arranged to define the shape of a great dodecahedron, each said surface element constituting an arm of two adjacent ones of the five-armed star shapes

defining the surface of the great dodecahedron, and means maintaining said surface elements in assembled relationship and



permitting each said star shape to be rotated about its central axis.

4,506,892

BALL AND TUBE GAME APPARATUS AND METHOD

Sheldon R. Shacket, 5142 N. St. Louis Ave., Chicago, Ill. 60625

Filed Feb. 8, 1984, Ser. No. 578,084
Int. Cl.[3] A63F *9/08*
U.S. Cl. 273—153 R 13 Claims

1. A mechanical toy comprising:

an elongated, transparent tubular sidewall having a longitudinal axis and a circular cross-section;

a pair of circular inserts, each said insert mounted adjacent an end portion of said tubular sidewall and cooperating with said sidewall to define an enclosed tube;

a fine granular material in said enclosed tube, the height of said granular material being at least seventy-five percent of said longitudinal axis when said tube is in a vertical position;

a ball-receiving chamber in said enclosed tube, said chamber defined by said tubular sidewall, a circular insert, and a top surface of said granular material when said tube is in a vertical position;

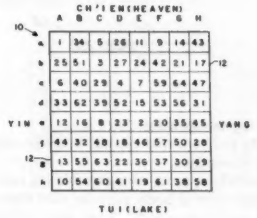
a sphere in said enclosed tube, said sphere having a diameter in excess of 50 percent of the diameter of said tubular sidewall circular cross-section and a mass sufficient to displace a quantity of said fine granular material when subjected to a periodic upward thrust.

4,506,893

METHOD OF PLAYING A GAME IN WHICH PLAYING PIECES ARE INVERTED

Mark E. Perry, 5030 N. 35th St., Arlington, Va. 22207

Filed Mar. 28, 1983, Ser. No. 479,262
Int. Cl.[3] A63F *3/02*
U.S. Cl. 273—258 7 Claims



1. A method of playing a board game, comprising the steps of,

providing a flat, two dimensional game surface means having peripheral boundaries defined in the marginal edges thereof,

subdividing said game surface means into a plurality of two dimensional position defining regions,

providing a plurality of game piece means divided into at least two different groups and provided with coding means so that the separate groups of game piece means are readily distinguishable by sensory inspection thereof,

initially deploying said groups of game piece means upon said game surface means so that each game piece means is deployed upon a different one of said position defining regions,

moving a preselected one of said game piece means from an occupied position defining region to any contiguous unoccupied region to complete a move, the players of said game alternating with one another in the making of said moves,

allotting to each player a total of two moves per player turn, which two moves are taken as two consecutive moves of a single game piece means or as a single move of two game piece means belonging to said player,

jumping an opponent's game piece means when said opponent's game piece means occupies a position defining region contiguous to that of one's game piece means and when said opponent's game piece means is intermediate an unoccupied position defining region and the region occupied by one's piece,

jumping one's own game piece menas when one's game piece means to be jumped is intermediate an unoccupied position defining region and one's game piece means to be moved,

deducting one move from one's total of two moves for each jumping of one's own game piece means,

not deducting a move from one's total of two moves for each jumping of an opponent's game piece means,

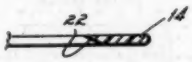
inverting said opponent's game piece means attendant jumping thereof to indicate a first jump of such opponent's game piece means, whereby said opponent's inverted game piece means remains in the possession of said opponent and remains on said game surface,

and playing said game at least in part by moving said game piece means beyond the peripheral boundaries of said game surface means and returning said game piece means to said game surface means by crossing a peripheral boundary thereof that is oppositely disposed to the boundary across which a game piece means exited said game surface means.

4,506,894
AERIAL TOY

Keith R. Laux, Columbus, and William F. Getgey, Cincinnati, both of Ohio, assignors to Idea Development Company, Inc., Cincinnati, Ohio

Filed Aug. 3, 1983, Ser. No. 519,918
Int. Cl.³ A63B 65/08
U.S. Cl. 273—425 **1 Claim**



1. An aerial toy comprising:

a central body portion, said central body portion having an upper and lower face,

four equiangularly spaced, elongate blades radially extending from said central body portion, said blades extending outwardly and downwardly from said central body portion in a smooth curve and at an angle of about 5° measured from the plane of the upper face of the central body portion,

the distal end of each blade being turned upwardly through an angle of about 25° to 90° measured from the plane of each respective blade, to thereby form a vane, the tips of all said vanes lying in a plane parallel with and slightly above the plane of the upper face of said central body portion, said vane comprising about 12° of the length of said blade,

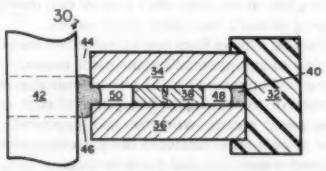
a thin outer circumferential ring attached to and coplanar with the tips of said vanes, said ring having generally parallel substantially flat upper and lower surfaces, said lower surface extending radially inwardly further than said upper surface such that said ring tapers from said upper surface to said lower surface along the radially inward portion of said ring, said ring having a generally squared-off leading edge, said tips being attached to the ring along the inside edge thereof,

said central body portion and said blades each having a small thickness, the thickness of said central body portion being about twice the thickness of a blade, each blade having an upper and lower face, said upper face of each blade being substantially flat, and said lower face being generally flat medially and tapering laterally to an edge coincident with said upper face.

4,506,895
SELF-ACTIVATING FERROFLUID SEAL APPARATUS AND METHOD OF USE

Kuldip Raj, Merrimack, N.H., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed Aug. 29, 1984, Ser. No. 645,399
Int. Cl.³ F16J 15/40
U.S. Cl. 277—1 **18 Claims**



16. A method for providing a self-activating ferrofluid exclusion seal about a magnetically permeable shaft which method comprises:

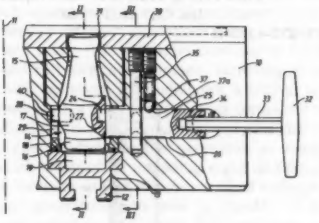
(a) retaining a defined quantity of ferrofluid in an interstage air gap between and at the one ends of a pair of spaced apart annular pole pieces having generally uniform sides with the other end of the pole pieces in a magnetic-flux relationship with an annular, permanent magnet, the ferrofluid retained in the interstage gap by the magnetic flux of the permanent magnet and the ferrofluid extending only slightly outward of the ends of the pole pieces to form a nonactivated ferrofluid seal capable of shipment with the ferrofluid retained in position in the interstage gap; and

(b) forming a ferrofluid O-ring seal about the surface of a magnetically permeable shaft by inserting the shaft within the annular pair of pole pieces, the shaft defining a sealed gap at the one end of the pole piece less than the interstage air gap, the ferrofluid, on inserting into the shaft, may form a nonactivated to an activated seal where the ferrofluid forms a generally T-shaped sectional ferrofluid O-ring seal about the surface of the shaft in the interstage and sealed gaps.

4,506,896
CHUCKS

Joseph F. Jackson, Halifax, and Ralph A. Waite, Bradford, both of England, assignors to Pratt Burnerd International Limited, Halifax, England

Filed Dec. 14, 1982, Ser. No. 449,568
Claims priority, application United Kingdom, Jan. 5, 1982, 8200145
Int. Cl.³ B23B 31/16
U.S. Cl. 279—118 **9 Claims**



1. A chuck comprising:

(a) a body rotatable about an axis;

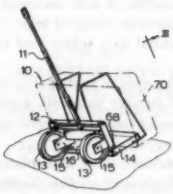
(b) at least one jaw movable in a radial direction to clamp a workpiece in the chuck;

(c) an operating lever mounted about a pivot on the body and operable to move the jaw radially, and means for moving the operating lever and pivot axially with respect to the chuck body to disengage the operating lever from the jaw thus enabling the jaw to be removed from the chuck body by movement in the radial direction.

4,506,897
COLLAPSIBLE LUGGAGE CARRIER

Sidney M. Libit, 29 S. LaSalle St., Chicago, Ill. 60603

Filed Dec. 13, 1982, Ser. No. 449,496
Int. Cl.³ B62B 1/04
U.S. Cl. 280—40 **9 Claims**



1. A collapsible luggage carrier comprising a base member having an undersurface, first and second wheel brackets

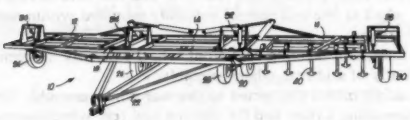
hingedly connected to said undersurface, wheels carried by said wheel brackets, said wheel brackets pivotable from a first position to a second position, the first position disposing said wheels rim and axes parallel to said undersurface, said second position disposing said wheels rim and axes normal to said undersurface, said base including a depending boundary wall extending around said undersurface adjacent the periphery thereof, movement of the wheel brackets from the first position to the second position causing said wheels to move inwardly towards one another into opposed relation overlying the undersurface within said boundary wall, a lock bracket pivotably connected to a member projecting from said underside, means on said lock bracket for engaging each of said wheel brackets in said first position and in said second position to lock said wheel brackets in each of said positions, handle means affixable to said base and projecting therefrom and support frame means pivotably carried by said base and pivotable from a first position parallel to said base to a second position substantially normal to said base, said frame means projecting from said base oppositely said wheels when said wheels are in said first position and said frame means is in said second position.

4,506,898

DRIFT ELIMINATOR FOR SERIES HYDRAULIC LIFT SYSTEM ON TILLAGE IMPLEMENTS AND THE LIKE

Maynard M. Herron, Hesston, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Feb. 2, 1984, Ser. No. 576,146
Int. Cl.³ F15B *11/16, 13/06, 15/24*
U.S. Cl. 280—43.23 **22 Claims**



1. A fluid-pressure power system comprising:
a double-acting, fluid-pressure-operated, master piston and cylinder unit;
a master supply and return line adapted for alternately connecting said master unit with a source of pressurized fluid and a reservoir;
at least one double-acting, fluid-pressure-operated, slave piston and cylinder unit;
a slave supply and return line adapted for alternately connecting said slave unit with a source of pressurized fluid and a reservoir;
a fluid line interconnecting said master unit and said slave unit in series flow relationship;
an actuatable control valve operable when open to open said slave supply and return line and when closed to close said slave supply and return line;
apparatus disposed for operating said control valve to close the same upon actuation of one of said units to a predetermined extent in one direction; and
means for precluding further actuation of the master unit in said one direction upon said closing of the control valve.

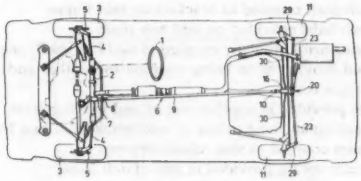
4,506,899

VEHICULAR STEERING SYSTEM

Shoichi Sano, Tokyo, and Yoshimi Furukawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,382
Claims priority, application Japan, Jun. 1, 1982, 57-93396; Jun. 1, 1982, 57-93397
Int. Cl.³ B62D *7/00*
U.S. Cl. 280—91 **2 Claims**

1. A steering system in a vehicle having front and rear wheels capable of being steered, comprising a rear wheel steering mechanism comprising:
a shaft member adapted to rotate in interlocking cooperation with a steering wheel, said shaft member being inserted and supported rotatably through a cylindrical holder in a sleeve fixed to a vehicle body;
a crank pin attached to said shaft member;
a joint member having a center portion thereof loosely mounted and supported on said crank pin;



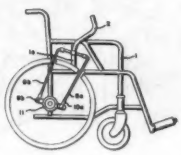
a link mechanism pivoted at one end thereof to the vehicle body and integrally connected at the other end thereof to said joint member; and
right and left rear wheel steering tie rods connected and supported respectively through ball joints to portions of said joint member disposed respectively on the right and left of said center portion thereof,
the axis of each said rear wheel steering tie rod, the center of each said ball joint and the core of said crank pin being substantially aligned with one another in a straight line on each of right and left sides.

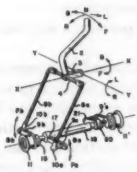
4,506,900

LEVER-OPERATED TYPE OF WHEELCHAIR

Akira Korosue, 6-604, 19, Tashiro-Cho, Nishinomiya-City, Hyogo-Ken, Japan

Filed Aug. 31, 1982, Ser. No. 413,263
Claims priority, application Japan, Nov. 26, 1981, 56-190091
Int. Cl.³ B62M *1/16*
U.S. Cl. 280—242 WC **2 Claims**

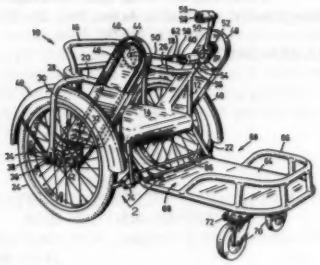




1. A lever-operated wheelchair comprising:
a wheelchair frame;
a single operational lever;
a differential link mechamism coupled to said lever, said link mechanism comprising:
a driving yoke coupled at one end to a base part of said single operational lever;
a frame pin provided on and extending from a side face of said frame;

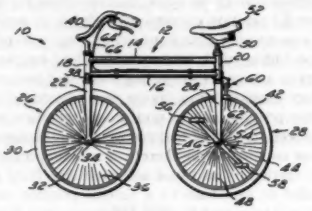
a crossed bearing for loosely couupling another end of said driving yoke to said frame pin;
a crossed shaft having a middle point connected to said end of said driving yoke;
a pair of joint yokes, one end of each yoke coupled to an end of said crossed shaft; and
a pair of longitudinally arranged torque rods, one end of each torque rod coupled to another end of said joint yoke; and
a pair of forward/backward clutch mechanisms comprising:
a hub shaft coupled to brackets on said frame;
clutch hubs provided on said hub shaft;
moving arms pivotally coupled to said hub shaft, one end of said moving arms being coupled to another end of said torque rods;
holes provided in another end of said moving arms;
release drums fixed to one of said brackets of said frame;
releases coupled to said release drums;
an outer spring provided in said clutch hubs;
an inner spring provided in said clutch hubs;
projections formed on one end of said inner and outer springs inserted into said holes in said moving arm; and
projections formed on another end of said inner and outer springs coupled to said releases;
whereby operation of said single lever of said differential link mechanism operates said pair of clutch mechanisms.

4,506,901
CHILD'S CHARIOT
Luigi Tosti, 2363 Parent St., Windsor, Ontario, Canada N8W 2E6
Filed Sep. 27, 1982, Ser. No. 424,428
Claims priority, application Canada, Sep. 22, 1982, 411931
Int. Cl.³ A61G 5/02
U.S. Cl. 280—242 WC **5 Claims**



1. A child's chariot comprising:
a frame having a seat portion, a seat back and left and right side arms;
a pair of rear wheels rotatably connected to the frame to support the seat portion above a ground surface;
the frame including an extended lower front foot platform, the foot platform being located vertically generally half way between the seat portion and said ground surface, the front foot platform including a low profile railing partially extending around the periphery of the foot platform, the railing being spaced from the seat portion to define access openings on either side of the foot platform;
a pair of front wheels rotatably connected to the extended front foot platform, the front wheels being mounted to pivot about vertical axes; and
drive means operably connected to each rear wheel, the drive means including hand cranks located respectively adjacent to said left and right side arms forward of the seat portion.

4,506,902
BICYCLE WITH STEERABLE WHEELS
Richard M. Maebe, 3026 Wenwood, La Verne, Calif. 91750
Filed Sep. 13, 1982, Ser. No. 417,022
Int. Cl.³ B62K 21/00
U.S. Cl. 280—266 **4 Claims**

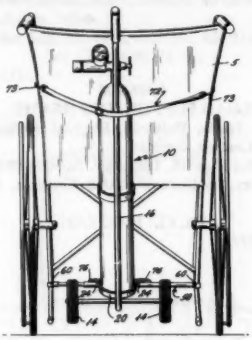


1. A riding apparatus comprising:
(a) a frame having a front portion, a middle portion, and a rear portion;
(b) a front wheel assembly rotatably coupled to said front portion of said frame;
(c) a rear wheel assembly rotatably coupled to said rear portion of said frame, said rear wheel assembly further comprising:
a rear axle;
a rear tire coupled to said rear axle; and
a rear fork retaining said rear axle, said rear fork having a shaft at one end thereof rotatably mounted within said frame;
(d) means for steering said front wheel assembly independently of said rear wheel assembly;
(e) saddle means connected to the rear wheel assembly for supporting a rider and for steering said rear wheel assembly independently of said front wheel assembly;
(f) means for pivoting said saddle means independently of said front and middle frame portions; and
(g) a pedal means for propelling said riding apparatus and for steering said rear wheel assembly independently of said front wheel assembly, said pedal means fixedly mounted to said rear axle, said pedal means causing said shaft of said rear fork to rotate within said frame to steer said rear tire.

4,506,903
WHEELCHAIR ATTACHMENT
Sidney P. Bowermaster, Carlisle, Pa., assignor to NDK, Incorporated, Carlisle, Pa.
Filed Mar. 3, 1983, Ser. No. 471,476
Int. Cl.³ A61G 5/02
U.S. Cl. 280—289 WC **6 Claims**

1. A wheelchair attachment device comprising:
means for detachably coupling a wheeled oxygen tank cart in tandem with said wheelchair such that said cart is stabilized fore and aft by said wheelchair and supportable vertically by wheels of said cart, said coupling means comprising means for spanning and attaching to horizontally spaced structural members near a base of said wheelchair for supporting and limiting forward movement of said cart, said coupling means further comprising means

for attaching said cart to a portion of said wheelchair above said base and limiting rearward tipping of said cart,



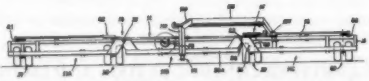
such that said wheelchair and said cart are rollingly transportable as a unit when coupled.

4,506,904

AGRICULTURAL IMPLEMENT CONVERTIBLE BETWEEN USE AND TRANSPORT POSITIONS

Jon E. Kinzenbaw, Williamsburg, Iowa, assignor to Kinze Manufacturing, Inc., Williamsburg, Iowa

Filed Sep. 27, 1982, Ser. No. 424,890
Int. Cl.³ B60D *1/14*; B62D *53/04*
U.S. Cl. 280—415 R **27 Claims**



1. An agricultural implement adapted to be converted between a use position and a transport position and pulled by a tractor in either of said positions comprising: a main carrier frame having a front and first and second sides; steerable support wheels for supporting said carrier frame; tools carried by said carrier frame; hitch means for coupling said frame to said tractor such that the front of said frame faces the direction of travel of said tractor when said tools are in use, said hitch means including a control member mounted between said frame and said tractor for movement between a use position and a transport position; releasable latch means for limiting the motion of said control member in said use position; and steering means responsive to the position of said control member for steering said support wheels in the forward direction in the use position and for steering said support wheels toward one of said first and second sides of said frame when said control member is moved to said transport position and said tractor moves to one of said sides of said frame.

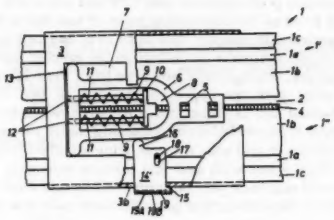
4,506,905

APPARATUS FOR FACILITATING A LONGITUDINAL ADJUSTMENT OF SKI-BINDING PARTS

Erwin Krob, and Helmut Bauer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Apr. 27, 1982, Ser. No. 372,405
Claims priority, application Austria, Apr. 28, 1981, 1892/81
Int. Cl.³ A63C *9/00*
U.S. Cl. 280—633 **23 Claims**

1. An apparatus for facilitating longitudinal adjustment of a ski-binding part on a ski, comprising: a guide rail adapted to be fastened on the ski, having two laterally spaced guide tracks extending longitudinally thereof, and having a toothed bar which extends longitudinally thereof; a slide plate having a locking member thereon which is engageable with said toothed bar; a guide plate which is provided over said slide plate, which is movably supported on said guide rail, and which carries a ski-binding part, wherein said guide plate and said slide plate each have a recess therein; two compression springs which each have first and second ends which are respectively supported on said guide plate and said slide plate, and which urge said slide plate to move relative to said guide plate; and extension means operatively coupled to said slide plate for facilitating movement of said slide plate against the force of



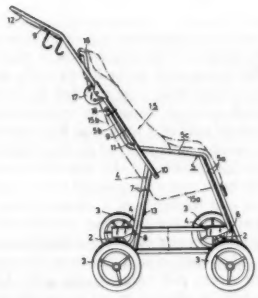
said compression springs so as to effect disengagement of said locking member thereon from said toothed bar on said guide rail, said extension means extending transversely of the ski and being adapted to be manually operated, said extension means being approximately aligned in directions longitudinally of the ski with said first ends of said springs; wherein said extension means includes a step, and wherein said slide plate is urged against said extension means by said compression springs and urges said extension means in a direction causing said step to move into engagement with a portion of said guide plate.

4,506,906

COLLAPSIBLE STROLLER

Per O. Alldén, Växjö , Sweden, assignor to Alvema Rehab AB, Alvesta, Sweden

Filed Apr. 18, 1983, Ser. No. 485,377
Claims priority, application Sweden, Apr. 28, 1982, 8202658
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—642 **4 Claims**



1. A collapsible wheelchair comprising a rectangular under-frame including two mutually parallel side members and two mutually parallel wheeled axles extending at right angles to said side members and joining the same; a collapsible superstructure supported by said under-frame; and a seat supported by said superstructure and including a seat portion and a back portion articulatedly attached to each other; said collapsible superstructure including, on either side of the carriage, a first, substantially S-shaped strut having two, mutually substantially parallel end portions and an intermediate portion therebetween and having one end connected pivotably about a horizontal

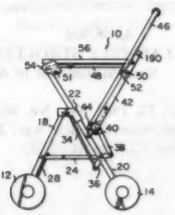
pivot axis to the associated side member at the forward end thereof, a second strut having one end connected pivotably about a horizontal pivot axis to said associated side member at the rear end thereof and the opposite end connected pivotably about a horizontal pivot axis to one end of a third strut, said third strut being connected at some distance from its said one end pivotably about a horizontal pivot axis to said first strut substantially at the angle between the intermediate portion and the upper end portion of said first strut, in such a manner that in the erect state of the superstructure the connection point between said second and said third struts is located in front of the connection point between said first and said third struts as well as in front of the connection point of said second strut to said associated side member, said third strut and said upper end portion of said first strut extending, in the erected state of the superstructure, contiguously upwards from their mutual connection point with the upper end portion of said first strut located behind and crossing said third strut, whereby the superstructure is prevented from collapsing under the weight of a person sitting in said seat, the seat being attached to said first and said third struts with said seat portion supported by said first strut and said back portion supported by said third strut on either side of the connection point between said first and said third struts.

4,506,907

BABY CARRIAGE

Takeshi Miyagi, Osaka, Japan, assignor to Zojirushi Baby Co., Ltd., Osaka, Japan

Filed Jun. 6, 1983, Ser. No. 501,393
Claims priority, application Japan, Dec. 11, 1982, 57-217516
Int. Cl.³ B62B 7/08, 7/14
U.S. Cl. 280—642 **8 Claims**



1. A baby carriage comprising a pair of front legs having front wheels mounted at the lower ends, a pair of rear legs having rear wheels mounted at the lower ends, sliders having the upper ends of said front legs pivoted to said sliders and slidable along said rear legs, transverse rods pivoted at one end to the upper ends of said rear legs, rear bars having the other ends of said transverse rods pivoted to the upper ends of said rear bars, rocker bars pivoted at the opposite ends to said rear legs and said rear bars, rear rods pivoted at one end to intermediate portions of said rocker bars, L-shaped levers pivoted in intermediate portions to the junctions between the mounting areas of said rocker bars and said rear wheels on said rear legs and having the other ends of said rear bars pivoted to one end of said L-shaped levers, pull bars pivoted at the lower ends to the other ends of said L-shaped levers and at the upper ends to said sliders, connector bars pivoted at one end to intermediate portions of said front legs and at the other ends to said rear legs between the mounting points of said rocker bars and said rear wheels on the rear legs, intersecting pipes pivoted to each other in intermediate portions and arranged in X-configuration, one of said pipes being pivoted at the upper end to the slider on one side of said baby carriage and at the lower end to a lower portion of the rear leg on the other side of said baby carriage and the other of said pipes being pivoted at the upper end to a lower portion of said rear leg on the other side of said baby carriage and at the lower end to the slider on said one side of the baby carriage and a pusher bar having a folding manipulation member and foldable in both the fore-and-aft and widthwise directions.

4,506,908

LOAD SUPPORTING BEAMS

Christopher N. Harle, Rothwell, England, assignor to Norde Suspensions Limited, England

Filed May 25, 1983, Ser. No. 498,081
Claims priority, application United Kingdom, Jun. 5, 1982, 8216428
Int. Cl.³ B60G 5/00
U.S. Cl. 280—677 **10 Claims**

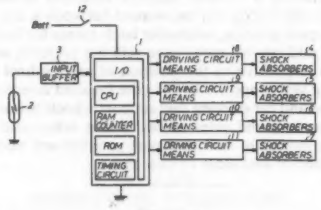
1. In a road vehicle suspension system a beam-like member for securing adjacent axles of a multiple axle system, said beam comprising two spaced plate-like members, each of which has an outwardly directed flange to one side and an inwardly directed flange to the other side, to be of generally Z-shaped cross-section, said two plate-like members being secured to and spaced by internal cross-members.

4,506,909

SHOCK ABSORBER CONTROL SYSTEM AND METHOD OF CONTROLLING THE SAME

Noriyuki Nakashima, Aichi, and Yoshinori Ishiguro, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 27, 1982, Ser. No. 453,153
Claims priority, application Japan, Dec. 28, 1981, 56-210632
Int. Cl.³ B60G 17/00
U.S. Cl. 280—707 **15 Claims**



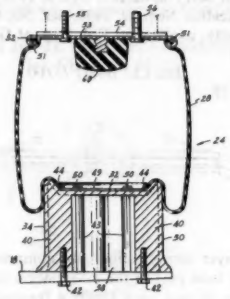
1. A shock absorber control system for a motor vehicle having shock absorbers, said system comprising:

a vehicle speed sensor for generating a vehicle speed signal in accordance with the rotations of a wheel; and operation control means having a microprocessor and a RAM for calculating acceleration and deceleration with respect to a moving direction of said vehicle from the vehicle speed signal from the vehicle speed sensor and producing a control signal dependent upon said calculated acceleration and deceleration, whereby attenuation forces of said shock absorbers are regulated in accordance with said control signal.

4,506,910
AUTOMOTIVE VEHICLE SUSPENSION

John Bierens, Farmington, Mich., assignor to Granning Suspensions, Inc., Livonia, Mich.

Filed Sep. 21, 1982, Ser. No. 420,921
Int. Cl.[3] B60G 15/00
U.S. Cl. 280—711 18 Claims

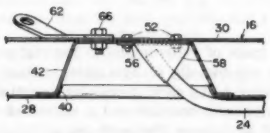


1. An automotive vehicle suspension comprising an axle, means for supporting the vehicle frame on said axle comprising a beam, a pivotal connection between the vehicle frame and one end portion of said beam, and an air spring between the vehicle frame and the other end portion of said beam, said air spring comprising an air spring lobe and a piston, said piston being of inverted, bowl shape having an annular wall terminating at the bottom in a circular peripheral edge, said air spring lobe being connected to the vehicle frame, said piston being mounted on said beam in laterally offset relation to the longitudinal centerline of said beam such that said peripheral edge along one side portion of said piston bears on said beam and said peripheral edge along the other side portion of said piston overhangs one side edge of said beam, and fastening means securing said piston to said beam, said piston having reinforcement ribbing extending inwardly from said annular wall with the bottom surface thereof in the plane of said peripheral edge and bearing on said beam and on said one side edge of said beam.

4,506,911
MOUNTING STRUCTURE FOR ANCHOR OF AUTOMOTIVE SEAT BELT

Yoshiharu Nakamura, Atsugi, and Mikio Kanda, Hiratsuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Nisssan Shatai Company, Limited, Hiratsuka, both of, Japan

Filed Aug. 3, 1983, Ser. No. 519,849
Claims priority, application Japan, Aug. 18, 1982, 57-142964
Int. Cl.[3] B60R 21/10
U.S. Cl. 280—801 7 Claims



1. A mounting structure for an anchor of a seat belt for a vehicle having a sliding door, comprising:

a vehicle side frame having an internal space and an opening leading to said internal space;

a guide rail for slidably supporting said sliding door and extending along said side frame, said guide rail having one end curving so as to extend through said opening in said side frame and entering into said internal space;

a reinforcement member disposed within said internal space of said side frame and having an opening corresponding to said opening of said side frame and receiving said curved end of the guide rail;

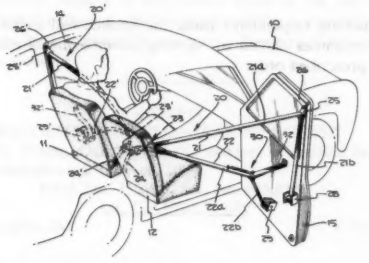
a fastener bolt for fixing said reinforcement member to said side frame; and

said seat belt anchor being commonly fixed to said side frame by said fastener bolt.

4,506,912
THREE-POINT AUTOMATIC RESTRAINT SYSTEM

Munir J. Ahad, Valencia, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Sep. 1, 1983, Ser. No. 528,725
Int. Cl.[3] B60R 21/10
U.S. Cl. 280—803 7 Claims



1. The improvement in a passive safety belt system having lap and chest belts with a common anchor for their inner ends at a location inboard of the associated vehicle seat and their respective outer ends anchored to the vehicle door whereby the chest and lap belts are moved automatically between a passenger restraint position when the door is closed and a passenger release position when the door is opened due to door movement, the door anchor for said lap belt including an emergency locking safety belt retractor mounted to a lower portion of the door, the improvement comprising the provision of:

lap belt lifting means including a flexible strap means of safety belt webbing operably connected between the vehicle door and portions of the lap belt running to the associated door mounted retractor for lifting the lap belt upwardly relative the vehicle seat overcoming the belt rewind bias for said retractor on said lap belt to facilitate passenger exit and entry relative the vehicle seat without the need for disconnecting the lap belt from its inboard anchor.

4,506,913
MARKET RESEARCH BOOKLET

Chang J. Kim, Cincinnati, Ohio, assignor to Burke Marketing Services, Inc., Cincinnati, Ohio

Filed Jun. 8, 1984, Ser. No. 618,915
Int. Cl.[3] G09F 1/08; G09B 7/00; B42D 15/00, 1/00
U.S. Cl. 283—56 5 Claims

1. An opinion research booklet comprising,

a cover page,

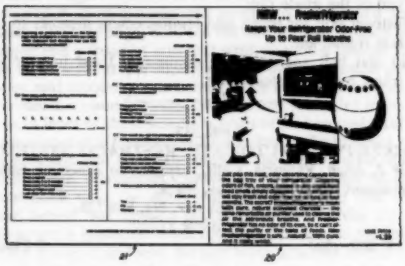
a plurality of folded pages, said folded pages being perforated along the folded edge for ease of tearing,

means binding together said cover page and said folded sheets at their free edges,

each said folded sheet having inwardly-facing surfaces, said surfaces having an advertisement on one side thereof and a series of questions relating to the advertisement on the other side thereof,

each folded sheet having a different advertisement,

said cover page containing instructions requiring the sequential tearing of the folded sheets and the responding to questions in sequence,



whereby respondents using the booket will avoid having responses tainted by viewing advertisements out of the prescribed order.

4,506,914

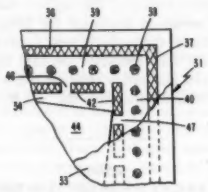
SECURITY SEAL

Garth W. Gobeli, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,143

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—70 **9 Claims**



7. A security package having a unique identification, said package comprising opposed sheets of transparent plastic material having first package seal means for sealing said sheets together to enclose the contents, wherein the improvement comprises:

second package seal means for sealing said sheets together extending parallel to and spaced from said first package seal means,

thermally imprinted print seal means, spaced between said first and second package seal means, for defining a random configuration of said material, said print seal means fusing said opposed sheets only in a localized area defining a dot-like formation.

4,506,915

IDENTIFICATION CARD WITH A RELIEF-TYPE SURFACE AND A PROCESS FOR PRODUCING THE SAME

Yahya Haghiri-Tehrani, and Joachim Hoppe, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 82,267, Oct. 5, 1979, abandoned. This application Nov. 29, 1982, Ser. No. 444,963

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845400

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—75 **7 Claims**

1. A multi-layer identification card comprising a card layer for carrying at least part of the information the card provides on one surface of said card layer; a transparent, protective plastic film covering all of the one surface of said card layer; an adhesive layer securing said card layer one surface to the said protective plastic film; the adhesive strength of the adhesive layer being greater than the tensile strength of the protective plastic film, whereby the film is irreversibly destroyed if removed from the card layer; steel gravure printing formed on the exterior surface of the protective plastic film prior to engagement of said film with said card one layer; said printing being highly visible and readily sensed by touch for verification purposes; the original relief present in said steel gravure printing of said transparent sheet being substantially unchanged in said indentification card after said transparent film covering is secured to said card layer one surface.

4,506,916

PLANAR CARD MADE OF A THERMOPLASTIC MATERIAL HAVING VISUALLY RECOGNIZABLE SAFETY MARKINGS AND METHOD OF MANUFACTURING SUCH CARD

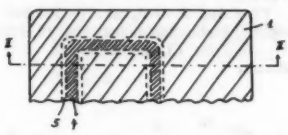
Adolf Kuhl, Oberrieden, Switzerland, assignor to Orell Fussli Graphische Betriebe AG, Zurich, Switzerland

Filed Feb. 19, 1982, Ser. No. 350,540

Claims priority, application Switzerland, Mar. 3, 1981, 1421/81

Int. Cl.³ B42D *45/00*

U.S. Cl. 283—91 **8 Claims**



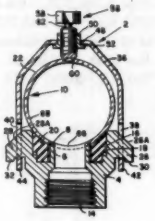
1. A card made of a thermoplastic material and having planar surfaces and visually recognizable, internal safety markings, comprising a first sheet consisting essentially of a transparent thermoplastic material and a second sheet consisting essentially of an opaque thermoplastic material, said second sheet having an inner surface provided with a relief structure, such that the varying thickness of the opaque material influences the local absorption of transmitted light, said relief structure having dimensions in the plane of the card to allow the visual distinction of areas of different local light absorption, and said first sheet having an inner surface provided with a corresponding, negative relief structure, said first and second

sheets being laminated upon each other with their inner surfaces contacting each other to form an interface, whereby through said card said relief structure is visually recognizable as a varying brightness due to varying light absorption of the transmitted light in the opaque sheet.

4,506,917
PIPE CONNECTION FITTING

Hansen Arne, Doylestown, Pa., assignor to Interfit, Inc., Norristown, Pa.

Filed Jul. 22, 1982, Ser. No. 400,985
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—4 **1 Claim**



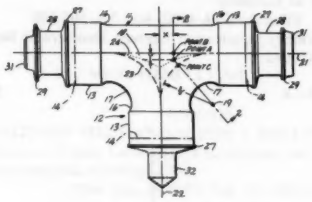
1. A pipe connection fitting for connecting a branch pipe to a main pipe comprising:
- a body having a nipple adapted to enter a branch opening in a pipe and a bore in communication with the nipple for the connection of a branch pipe to the body;
- a seal mounted on said body surrounding the nipple for sealing against the pipe;
- a pair of opposed ears integral with said body;
- a strap having an opening adjacent each end to receive an ear;
- said ears each having a tapered cam portion to cam the ends of the strap outwardly as the strap is moved downwardly until the strap openings engage the ears;
- said ears having depending lobe portions which prevent the strap ends from moving outwardly,
- said strap having a threaded opening midway between the ends thereof; and
- a break-away screw threaded through said strap opening and adapted to engage the pipe to secure the body to the pipe,
- said screw having a head portion which will break off at a predetermined torque,
- said bore being threaded to receive a branch pipe,
- said screw having a cutter end pipe adapted to cut into the main pipe until the head portion of the screw breaks off at a predetermined torque.

4,506,918
FIBER REINFORCED PLASTIC PIPE TEE

Ralph S. Friedrich, Hermosa Beach, and Kenneth C. Naylor, Rancho Palos Verdes, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Continuation of Ser. No. 186,338, Sep. 11, 1980,. This application Jun. 20, 1983, Ser. No. 505,114
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—156 **29 Claims**

1. A fiber reinforced plastic pipe tee having a straight run and a side branch and characterized by a symmetrical bulge on each side of the tee on at least the inside surface of the tee wherein each of a family of radial cross sections through the bulges on the tee normal to the mid-plane of the tee has a symmetrical pseudo-elliptical shape with the difference between the major axis and the minor axis of the family of pseudo-elliptical cross sections being greatest at a location spaced apart from the axis of the run in the direction of the end of the branch and decreasing towards the ends of the branch and run, the family of radial cross sections being selected from the group consisting of (a) a cross section on two planes, one of which extends radially in one crotch between the run and the branch, and the other of which extends radially in the other crotch, the two planes intersecting a directrix of the tee at the

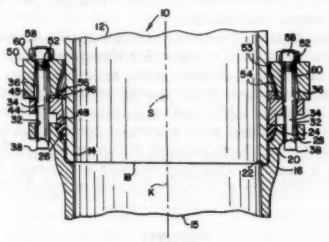


same location and (b) a cross section on two planes, one of which extends radially in one crotch between the run and branch, and the other of which extends radially across the back of the run, the two planes intersecting a directrix of the tee at the same location.

4,506,919
RESTRAINED MECHANICAL PIPE JOINT

Robert G. Peting, Oak Forest, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 3, 1983, Ser. No. 455,019
Int. Cl.³ F16L *5/00*
U.S. Cl. 285—231 **4 Claims**



1. A restrained mechanical pipe joint assembly for joining a spigot to a socket end including an enlarged base for receiving said spigot and an annular gasket accommodating recess and an outwardly projecting restraining flange having a plurality of angularly disposed openings, said mechanical joint assembly comprising:
- (a) a spigot ring fixedly secured to said spigot spaced inwardly from the terminal end thereof;
- (b) a compressible gasket seated in said gasket accommodating recess;
- (c) a bolt assembly including a head underlying said restraining flange and a shank having a threaded end and nut threaded thereon, said bolt shank loosely accommodated within said flange openings;
- (d) a retaining ring having a plurality of openings angularly spaced complementary to said restraining flange openings and loosely receiving the shanks of said bolts, said retaining ring having an inner annular surface of said spigot end and a concave surface engagable with said spigot ring thereby permitting limited axial misalignment of said spigot and socket longitudinal axes; and

an annular gland disposed between said retainer ring and said restraining flange so that upon tightening of said bolt assembly said spigot is secured in said socket and said gasket is compressed into sealing engagement with said spigot.

4,506,920

KNOTTER FOR BALING MACHINE

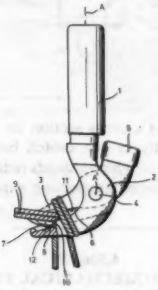
Horst Raussendorf, Bautzen, and Gerhard Raussendorf, Singwitz, both of German Democratic Rep., assignors to Veb Kombinat Fortschritt Landmaschinen, Neustadt/Sachsen, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,180

Claims priority, application German Democratic Rep., Nov. 22, 1982, 2450942

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—8 3 Claims



1. A knotter for a baling machine, the knotter comprising:

a pivotal lower jaw; and

an upper jaw pivotal on the lower jaw about a knotter axis extending transverse to the jaws, the upper jaw having

a tip remote from the axis,

a lower edge lying between the tip and the axis and forming with the lower jaw a tie-holding opening,

a first lateral flank directed in one axial direction and lying mainly in a plane perpendicular to the axis; and

a second lateral flank directed in the opposite axial direction and formed with a groove open in the opposite direction and terminating at the lower edge at the opening, whereby a tie looped through and around the jaws can extend away from the opening in the groove.

4,506,921

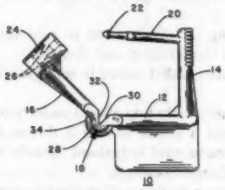
SECURITY SEAL

Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Dec. 27, 1982, Ser. No. 451,920

Int. Cl.³ B65D *27/30*

U.S. Cl. 292—318 5 Claims



1. A one piece plastic seal, comprising a pair of relatively movable members joined at a flexible hinge, said members carrying cooperating means for locking together and being movable together about said hinge to effect locking engagement of said cooperating means, and tension spring means attached to the members and extending around the outside of the hinge, said spring means being dimensioned to be placed in tension when the members are moved together to engage said fastener portions,

in which a portion of the members adjacent said hinge have surfaces adapted to abut each other before said cooperating means become engaged when the members are pivoted toward the locking position, whereby resilient flexing of at least one of said members is required to effect engagement of said cooperating means.

4,506,922

PANIC HANDLE FOR DOORS

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 468,134, Feb. 22, 1983, which is a continuation-in-part of Ser. No. 185,375, Sep. 8, 1980, Pat. No. 4,382,620, which is a continuation-in-part of Ser. No. 152,403, May 22, 1980, Pat. No. 4,366,974. This application Sep. 14, 1983, Ser. No. 532,215

The portion of the term of this patent subsequent to Jan. 4, 2000, has been disclaimed.

Int. Cl.³ E05C *1/14*

U.S. Cl. 292—336.3 8 Claims

1. A panic handle apparatus for use with a door, said handle comprising a bar adapted to be carried by a door, mounting means for mounting the bar on a door, pivot means associated with the bar allowing limited pivotal movement of the bar toward and away from a door when installed on a door; said bar having a latch mechanism longitudinally disposed therein and terminating in a latch bolt at an end of the bar; an actuator post adapted to be stationarily carried by a door at a location along the door spaced from the mounting means; said actuator post and said latch mechanism comprising means operationally engagable each with the other whereby the latch mechanism is movable between latched and unlatched positions upon pivotal movement of the bar, bringing the actuator post and the bar's latch mechanism into operational engagement with each other.

4,506,923

TAKEOUT TONG HEAD

Richard A. Walker, and Robert J. Douglas, both of North Granby, Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

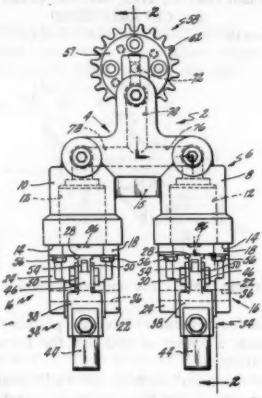
Filed Feb. 7, 1983, Ser. No. 464,799

Int. Cl.³ B66C *1/42, 1/28*

U.S. Cl. 294—87.1 8 Claims

1. A takeout tong head comprising a support bracket having an upper portion adapted to be attached to a takeout arm and a lower portion having at least one cylinder housing, a cylinder and tong assembly for each cylinder housing, each said assembly including a mounting flange removably attached to its respective cylinder housing, a cylinder integral with said flange and extending upwardly therefrom into said cylinder

housing, a piston member within said cylinder, a scissors tong assembly extending downwardly from said flange below said cylinder, a piston rod extending from said piston to said scissor



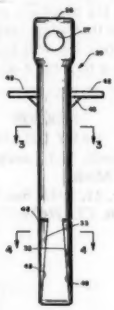
tong assembly to cause the operation thereof upon movement of the piston, and a spring contained between said flange and said piston member to urge said piston member in a direction away from said flange.

4,506,924

ROCK LIFTING DEVICE

Charles E. Nieder, 17519 Lyons Valley Rd., Jamul, Calif. 92035

Filed Sep. 30, 1982, Ser. No. 429,105
Int. Cl.³ B66C 1/66
U.S. Cl. 294—89 **8 Claims**



1. A rock lifting device comprising:

an elongated shaft having a longitudinally extending axis;

a pair of wedge surfaces formed on the outer surface of said shaft adjacent its bottom end, said pair of wedge surfaces being substantially diametrically opposed to each other, the top end of each of said wedge surfaces being located farther inwardly from the outer surface of said shaft than its bottom end of said wedge surface, said wedge surfaces being substantially planar;

at least two feather members, each feather member having a shank portion, an arm member extending outwardly from its top end, and a wedge portion extending from the bottom end of said shank portion, said wedge portion having a substantially planar wedge surface upon its inner face;

the sum of degrees of each set of mating wedge surfaces is substantially 90 degrees; and

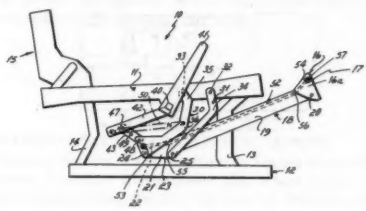
means adjacent the top end of said shaft for attaching a lifting device thereto.

4,506,925

FOOTREST MECHANISM FOR A RECLINING CHAIR

Michael A. Crum, LaGrange, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jan. 5, 1983, Ser. No. 455,652
Int. Cl.³ A47C 1/034
U.S. Cl. 297—69 **13 Claims**



1. An improved footrest extension and retraction mechanism for a reclining chair, the chair having a back movable to plural positions of varying angularity, and a seat frame with opposed sides and a forward end and a rearward end, comprising:

a pair of spaced substantial parallel footrest glide bars located beneath the seat frame, a glide bar being located on each side of the seat frame, the glide bars each having a rearward end and a forward end,

a footrest bracket pivotally mounted to the forward ends of the glide bars and extending therebetween, the footrest bracket having a footrest support face,

a pair of suspension links for each glide bar, each pair of suspension links being laterally spaced along one side of the seat frame and comprising a forward and a rearward suspension link, the suspension links having an upper end and a lower end, the upper end of each suspension link being pivotally connected to a portion of the seat frame, the lower end of each suspension link being pivotally connected by a pivot connection to a portion of a respective glide bar,

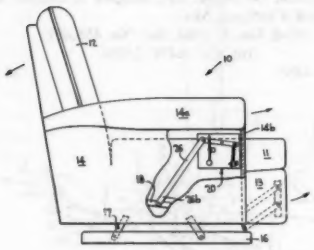
drive means operatively interconnected between said seat frame and said glide bars for driving the glide bars in tandem in a forwardly and upwardly arcuate motion,

a footrest pivoting mechanism to change the orientation of the footrest bracket relative to the glide bars between a footrest bracket retracted position wherein the footrest supporting surface is substantially vertical, to an extended position wherein the footrest supporting surface is substantially horizontal, the footrest pivoting mechanism comprising a rigid footrest bracket control rod extending generally along the side of a glide bar, one end of said control rod being pivotally connected to said footrest bracket, the opposite end of the control rod being pivotally connected to the lower end of one of said suspension links by a pivot connection spaced from the pivot connection between said one of said suspension links and said glide bar such that pivoting movement of said one of said suspension links relative to said seat frame results in a change of orientation of the footrest bracket relative to the glide bars.

4,506,926
RECLINING CHAIR WITH PUSH-BUTTON ACTUATOR MECHANISM

Alvie Griggs, Jr., Okolona, Miss., assignor to PeopLoungers, Inc., Nettleton, Miss.

Filed Apr. 4, 1983, Ser. No. 482,021
Int. Cl.[3] A47C *1/02*
U.S. Cl. 297—83 8 Claims



1. A push-button actuator mechanism for use in a reclining chair that includes a seat, a backrest, a footrest, opposite chair sides, a chair base, and a carriage mechanism mounting the seat, backrest, footrest and chair sides above the chair base and enables them to move relative to each other and to the chair base so as to cause the reclining chair to be repositioned from an upright positioning to a reclined positioning and vice versa, said push-button actuator mechanism being capable of activating the carriage mechanism so as to reposition the reclining chair from its upright positioning to a reclined positioning, said push-button actuator mechanism including

a support plate which is attachable to the front stump of one of said chair sides so as to extend towards the back of said reclining chair, said support plate having a side which faces outwardly of said reclining chair,

a pin bracket attached to said side of said support plate,

first and second anchoring brackets attached to said side of said support plate,

an actuator arm pivotally connected to said pin bracket to be movable in a first plane, said actuator arm including a first end, a second end, and a step-like indentation near its second end,

a first spring means connected between said first end of said actuator link and said first anchoring bracket,

a drive arm pivotally connected at its first end to said second end of said actuator arm, the second end of said drive arm being pivotally connectable to a control link of said carriage mechanism,

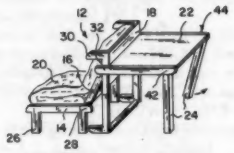
a hawkbill latch arm pivotally connected to said second anchoring bracket so as to be movable in a second plane which is generally perpendicular to said first plane, said latch arm including a first end having a curved lip projecting towards said support plate and a second end mounting a button projecting away from said support plate, said curved lip being engageable with said step-like indentation in said actuator arm, and

a second spring means connected to said hawkbill latch arm to bias said hawkbill latch arm about said second anchoring bracket such that its first end tends to move towards said support plate.

4,506,927
CONVERTIBLE TABLE, CHAIR, AND BED COMBINATION

Anthony Lombardo, 979 Third Ave., New York, N.Y. 10022

Filed Dec. 27, 1982, Ser. No. 453,699
Int. Cl.[3] A47C *13/00*
U.S. Cl. 297—118 2 Claims



1. A convertible table, chair and bed combination comprising:

(a) a first flat frame member having a plurality of legs, each said leg near a corner of said first flat frame member to engage a floor;

(b) a second flat frame member pivotally connected to the top of one side of said first flat frame member;

(c) a third flat frame member also having a plurality of legs, each said leg near a corner of said thrid flat frame member, said third flat frame member pivotally connected at one side from bottom to said second flat frame member so that when said second flat frame member is down over said first flat frame member, said third flat frame member will fit over said first flat frame member and second flat frame member so as to form a coffee table;

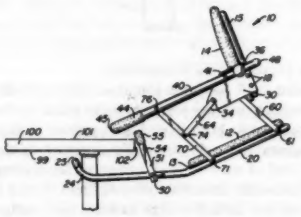
(d) a platform pivotally connected to said third flat frame member at the same side said third flat frame member is pivotally connected to said second flat frame member so that when said third flat frame member is placed in a vertical position said platform can pivot to a horizontal position; and

(e) at least one long leg pivotally connected to an underside of said platform so that when said platform is in a horizontal position said long leg will pivot to a vertical position engaging said floor to form a dining table.

4,506,928
BABY CHAIR

Samuel Marion, Mahwah, N.J., assignor to Gerber Products Company, Fremont, Mich.

Filed Mar. 11, 1983, Ser. No. 474,235
Int. Cl.[3] H47B *39/00*
U.S. Cl. 297—174 21 Claims



20. A baby chair of the type for mounting to the edge of a table top having upper and lower surfaces, comprising:

a chair structure;

a first arm attached to and extending from said chair structure for engagement of said upper surface;

a second arm attached to and extending from said chair structure for the engagement of said lower surface; and

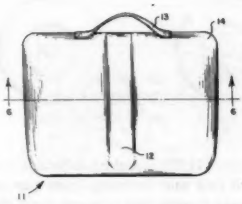
locking means pivotally mounted to said second arm for further engagement of said lower surface to ensure the maintenance of the baby chair to the table top.

4,506,929

LUMBAR RIDGE SUPPORTING

Kirt L. Josefek, 344 Union Ave., Framingham, Mass. 01701

Filed Jul. 26, 1982, Ser. No. 401,743
Int. Cl.³ A47C *7/02*
U.S. Cl. 297—230 **1 Claim**



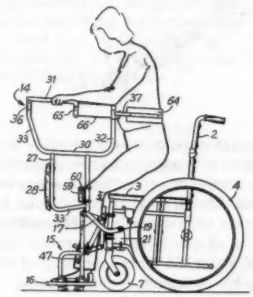
1. A lumbar support cushion comprising a resilient material approximately thirteen inches high and having a generally convex curvature in the vertical direction and a generally concave curvature in the horizontal direction, and lumbar ridge means disposed centrally in said cushion and extending vertically from just above the base of the cushion to the top of the cushion for mating engagement within the lumbar spinal recess formed by the muscles attached to the bilateral transverse processes of the precise spine for providing lumbar support which allows the muscles to maintain normal lordodic curvature, said lumbar ridge means being approximately two inches wide and twelve inches high and having a generally convex curvature in both the vertical and horizontal directions.

4,506,930

WHEEL-CHAIR ADAPTED TO ENABLE THE PATIENT TO STAND UP

Jean-Pierre Lambert, Saint-Cyr-sur-Loire, France, assignor to Etablissements Poirier, France

Filed Feb. 12, 1982, Ser. No. 348,412
Claims priority, application France, Feb. 23, 1981, 81 03546
Int. Cl.³ A61G *5/00*
U.S. Cl. 297—423 **9 Claims**



1. In a wheelchair designed to allow a patient to stand up, and especially for use by a paraplegic patient, comprising a conventional frame resting on the ground by means of forward and backward displacement members and supporting a seat, a backrest, a movable footrest, and a movable structure adapted to occupy the two following positions: a first position, in which the said structure is retracted so as to leave free at least the space at the front of the seat, while maintaining the rolling possibilities of the wheelchair, and, a second position in which the said structure is set in the free space situated in front of the seat while remaining accessible to the hands of the user sitting in the wheelchair and rests on the part of ground situated at the front of the seat, wherein the improvement in said movable structure comprises:

two frames independent of said seat and backrest which extend substantially parallel to the sides of the wheelchair, one frame on each side of said wheelchair,

pivot means mounting said independent frames to said conventional frame for pivoting on said conventional frame about horizontal tranverse axes which permit forward pivoting movement of each independent frame over substantially 90°, and

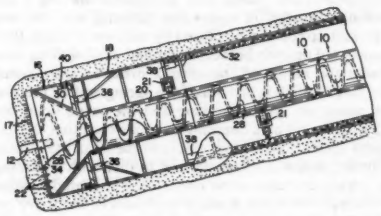
a set of bars, for providing forward and rearward support for said patient after standing up, pivotally mounted to said independent frames and initially situated in the first position of the independent frames at the back of said seat, and, in the second position of the independent frames in the free space at the front of said seat.

4,506,931

METHOD AND APPARATUS FOR MINING

John C. Haspert, Arcadia, Calif., assignor to United States Pipe and Foundry Company, Birmingham, Ala., a part interest

Continuation-in-part of Ser. No. 003,184, Jan. 15, 1979, Pat. No. 4,280,732. This application Jun. 4, 1981, Ser. No. 270,429
Int. Cl.³ E21D *1/06*
U.S. Cl. 299—1 **6 Claims**



1. An apparatus for continuously mining a mineral deposit comprising:

(a) rotary mining head drive stem comprising a number of hollow cylindrical sections, said sections being interconnected in an end-to-end sequence, and conveyor flights attached to the inside of each of said hollow cylindrical sections in a uniform helical pattern, said drive stem being adapted for attachment to a mining head so that a rotational and/or forward or rearward movement in a mine shaft of said drive stem will cause a corresponding rotational and/or forward or rearward movement of the attached mining head, whereby said drive stem can deliver forward drilling thrust to said attached mining head and at the same time generate a rearward movement of mined material by means of said helical conveyor flights,

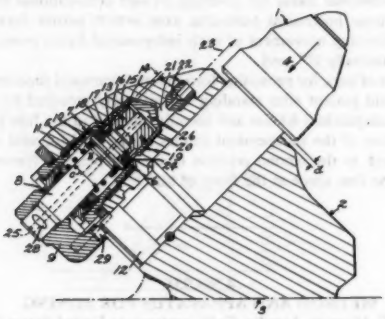
(b) means for preventing collapse of said mine shaft comprising support collars located inside said shaft from behind said mining head to the mine portal, said support collars comprising pipe-like sections equipped with means for supporting said drive stem, whereby said drive stem can rotate around and move longitudinally along the central longitudinal axis of said support collars, and

(c) load cells for sensing the pressure between said mining head and said mine support collars and for controlling the movement of said support collars into and out of the mine.

4,506,932
DEVICE FOR COOLING THE BITS OF A CUTTING MACHINE

Alfred Zitz; Otto Schetina, and Herwig Wrulich, all of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed May 27, 1982, Ser. No. 382,651
Claims priority, application Austria, Jun. 4, 1981, 2518/81
Int. Cl.³ E21C 7/08
U.S. Cl. 299—1 **2 Claims**



1. A device for cooling a bit of a cutting machine with a flow of water comprising a nozzle, arranged adjacent the bit, for cooling water to be ejected under pressure, a valve assembly which includes a valve housing and a valve cone movable into contact with a valve seat to close the valve assembly in the flow direction of the water, said valve cone having a valve shaft sealingly guided in said valve housing and the water supply to said nozzle can be closed by said valve cone, the bit being supported on a bit holder for limited axial shifting movement under the action of the cutting pressure and against a restoring force which is provided by a spring and by the water pressure acting on the valve cone and the valve cone being coupled with the bit by a coupling member such that the valve cone opens upon a shifting movement of the bit in the direction of the cutting pressure, characterized in that with an arrangement in which the valve cone opens only at a predetermined load on the bit, the water pressure upstream of the valve cone multiplied by an active surface of the valve cone which is subjected by the water pressure to a force tending to close the valve essentially corresponds to the restoring force and in that the spring has only such a strength that the spring moves the valve cone, with the water supply shut off, against the weight of the valve cone and the weight of the bit and against the internal frictional resistances, the valve cone being rigidly connected with a piston which is arranged downstream of the valve cone and sealingly guided within a cylinder in the valve housing, there being a space between valve cone and piston which space is connected via at least one exit opening for the water with a space upstream of the nozzle, the piston having a diameter greater than the diameter of the shaft of the valve cone.

4,506,933
VEHICLE TRACK HAVING FLEXIBLE INTERCONNECTED LINKS

Georg Wadell, Valdemarsvik, Sweden, assignor to Gislaved Aktiebolag, Sweden

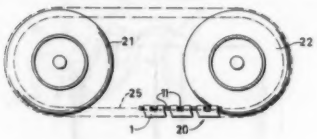
Filed May 10, 1983, Ser. No. 493,346
Claims priority, application Sweden, May 12, 1982, 8202975
Int. Cl.³ B62D 55/20
U.S. Cl. 305—35 R **20 Claims**

1. A vehicle track for installation across a pair of rubber wheels, comprising:

a plurality of flexible track links (1,31) which extend laterally over the shoulders of the wheels, the track links (1,31) at the respective sides of the track having cylindrical holes (2,3; 32,33) which extend in the longitudinal direction of the track;

two longitudinally extending chain-like connecting units (25) in the respective holes on opposite sides of the track links for holding said track links together to form a track;

each chain-like connecting unit (25) including a plurality of fastening units (5, 35) rotatably journalled in said cylindrical holes (2,3; 32,33) of said track links; and a plurality of



coupling means (11,27) coupling adjacent fastening units together such that said fastening units can rotate in said holes when said flexible links change form due to flexing thereof in use;

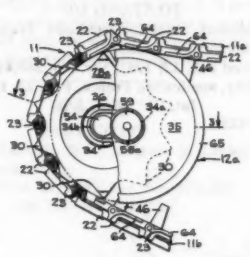
said fastening units (5,35) each including a cylindrical central portion (6) and lug portions (15,16) which project axially from opposite ends of said cylindrical central portion; and

said coupling means (11,27) engaging said lug portions (15,16) of adjacent fastening units (5,35) to connect said adjacent fastening units together.

4,506,934
CHORDAL ACTION ISOLATION WHEEL ASSEMBLY

Stephen A. Hammond, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 7, 1983, Ser. No. 456,220
Int. Cl.³ B62D 55/12
U.S. Cl. 305—57 **5 Claims**



1. A chordal action isolation wheel assembly for an endless-track laying vehicle, said wheel assembly comprising:

a rotatable drive axle for connection to a power source;

a sprocket wheel having a sprocket hub fixed to said drive axle for rotation with said axle, said sprocket wheel having a plurality of axially spaced sprocket teeth equidistantly spaced about the outer periphery of said sprocket hub for movably engaging an endless track;

a pendulous arm having a first end portion rotatably mounted about said drive axle;

an isolation wheel; and

means for rotatably mounting said wheel to a second end portion of said pendulous arm with said endless track threaded about said isolation wheel said isolation wheel having an upper portion in a plane higher than the upper portion of said sprocket wheel, said isolation wheel supporting said endless track and gently lowering said track onto said sprocket wheel as said sprocket wheel rotates.

4,506,935

BAR-TYPE SLIDE GUIDING APPARATUS WITH HYDROSTATIC BEARINGS

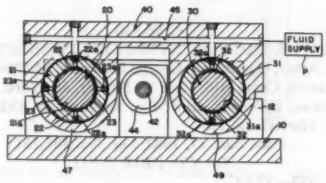
Hiroshi Suzuki, Okazaki; Akira Tsuboi, Kariya, and Kazuhiko Sugita, Anjoh, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 6, 1983, Ser. No. 482,443

Claims priority, application Japan, Apr. 12, 1982, 57-61633; Apr. 12, 1982, 57-53597

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—5 R 2 Claims



1. A slide guiding apparatus comprising in combination:

a fixed base;

first and second cylindrical pilot bars fixedly mounted on said fixed base and extending in parallel relation with each other in a first direction;

a first hydrostatic bearing having a cylindrical hole through which said first pilot bar passes, said first hydrostatic bearing being formed at said cylindrical hole thereof with a first pair of fluid pockets which are diametrically opposed with each other in a second direction perpendicular to said first direction and a second pair of fluid pockets which are diametrically opposed with each other in a third direction perpendicular to both of said first and second directions, each of said second pair of fluid pockets being wider in circumferential width than each of said first pair of fluid pockets;

a second hydrostatic bearing having a cylindrical hole through which said second pilot bar passes, said second hydrostatic bearing being formed at said cylindrical hole thereof with a third pair of fluid pockets which are diametrically opposed with each other in said second direction, and each of said first pair of fluid pockets being substantially the same width as each of said third pair of fluid pockets in a circumferential direction;

a slide member fixedly mounted on said first and second hydrostatic bearings for bodily movement therewith along said first and second pilot bars; and

means for supplying pressurized fluid to said first, second and third pairs of fluid pockets so as to generate hydrostatic pressure force in each of said first, second and third pairs of fluid pockets.

4,506,936

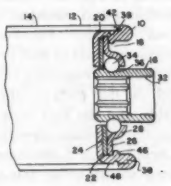
BEARING ASSEMBLY

Donald A. Miller, 7315 Glastonbury, Hudson, Ohio 44221

Filed Mar. 10, 1983, Ser. No. 474,041

Int. Cl.³ F16C *35/067*

U.S. Cl. 384—569 17 Claims



1. A bearing for registration in the end of the cylindrical tubular body of a cylindrical tubular roller of a conveyor having an inner race member, an outer race member, and discrete bearing elements positioned between said inner and said outer race members to effect relative rotation therebetween, said outer race member including an outer casing, an outwardly facing annular plate and an annular washer, both of said annular plate and washer are captured by retaining means provided on said outer casing, said washer and said annular plate defining the outer race for said bearing elements, said outer casing having an axially outwardly facing skirt portion the end thereof being rolled-over to form a substantially U-shaped annular portion, said U-shaped annular portion of said skirt portion terminating in a lateral face which, when said bearing is inserted in the end of said conveyor roller, abuts the laterally extending face of the end of said conveyor roller, the U-shaped annular portion providing a radius of curvature at the end of said conveyor roll.

4,506,937

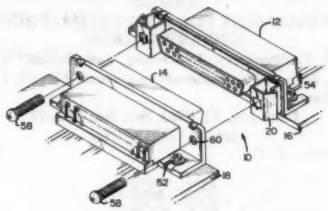
LATCHING-GROUNDING BLOCKS

Pete Cosmos, Mechanicsburg, and Earl C. Myers, Jr., Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 2, 1983, Ser. No. 490,702

Int. Cl.³ H01R *4/66*

U.S. Cl. 339—14 R 7 Claims



1. In combination with an electrical connector having an insulative housing with a peripheral flange, a latching-grounding block comprising:

a conductive block having a substantially S-shaped profile with three parallel planar portions the first and second of which are closely spaced to form a first connector gripping portion to grip the peripheral flange of the connector there between and the third planar portion being spaced from the other planar portions to be approximately even with a mating face of the connector forming a second fastening member receiving portion, said third planar portion and at least one of said first and second planar portions having a formed or captivated nut configuration.

4,506,938

INTEGRATED CIRCUIT CHIP CARRIER MOUNTING ARRANGEMENT

James J. Madden, Naperville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

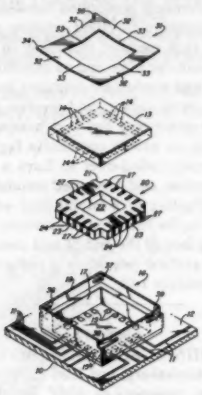
Filed Jul. 6, 1982, Ser. No. 395,291

Int. Cl.³ H05K *1/12*

U.S. Cl. 339—17 CF 12 Claims

1. A mounting arrangement for mounting an integrated circuit chip carrier on a printed wiring board comprising a socket for receiving said chip carrier mounted on said board, a contact interface element fitted within said socket, and an array of electrically conductive annular springs individually retained by said element, said annular springs being oriented about a common axis within said springs, each said spring being substantially perpendicular to said axis, first arc portions of said springs making electrical contact with corresponding

electrical contact pads on said printed wiring board, said springs being positioned so that second opposite arc portions of



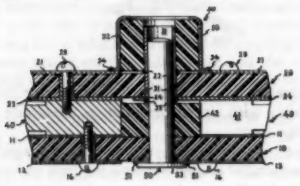
said springs can make electrical contact with corresponding contact pads of said chip carrier.

4,506,939

ARRANGEMENT FOR CONNECTING PRINTED CIRCUIT BOARDS

Wayne J. Faulkenberry, Lynchburg, and Earnest A. Franke, Goode, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jan. 31, 1983, Ser. No. 462,622
Int. Cl.³ H05K *1/00*
U.S. Cl. 339—17 C **2 Claims**



2. An improved arrangement for providing a connection between circuit boards comprising:

a. a first circuit board having at least first and second circuits on a first surface thereof and having an opening from said first surface to a second surface thereof;

b. a coaxial connector having inner and outer conductors and mounted on said first circuit board, said inner conductor comprising a hollow tube extending from said first surface through said opening and into said outer conductor, said inner conductor being accessible at both ends of said coaxial connector;

c. means connecting said outer conductor to said first circuit and connecting said inner conductor to said second circuit;

d. a conductive chassis attached to said first circuit, said chassis being separated from said second circuit;

e. a second circuit board having at least first and second circuits on a first surface thereof and having another opening from its said first surface to a second surface thereof;

f. means attaching said first circuit of said second circuit board to said chassis, and with said second circuit of said second circuit board being separated from said chassis; and

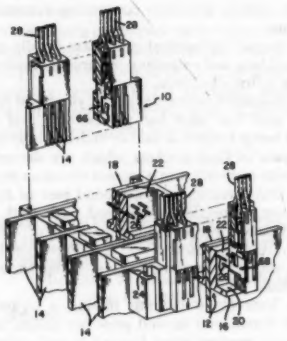
g. an elongated pin electrically connected to said second circuit of said second circuit board and extending through said openings into electrical connection with said inner conductor.

4,506,940

INPUT/OUTPUT INTERCARD CONNECTOR

John C. Asick, Harrisburg; George H. Douty, Mifflintown; John M. Landis, Camp Hill; Clair W. Snyder, Jr., York, and James S. Staron, Dillsburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 17, 1983, Ser. No. 505,151
Int. Cl.³ H01R *23/72*
U.S. Cl. 339—17 LC **7 Claims**



1. An intercard connector system comprising

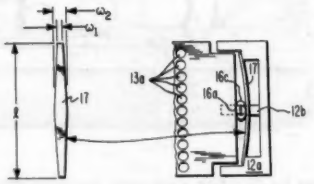
an elongated header member of rigid insulative material having oppositely directed mounting and mating surfaces, said header member having the mounting surface engaging a circuit board, profiled means at each end of said header member allowing mating only in a direction coplanar to said mating surface, a plurality of pin terminals mounted in said header member in patterned array with one end of each terminal engaging circuitry of said circuit board and the other end projecting from said mating surface; and

a connector member having an elongated housing of rigid insulative material having a mating portion profiled to be received in said header member in a direction parallel and adjacent to said mating surface and a terminating portion, a plurality of terminal passages each extending between said mating and terminating portions with adjacent passages opening in opposite directions at said terminating portion enabling said passages to have a close centerline spacing, and a plurality of first and second terminals alternating in adjacent ones of said passages, each said terminal having a conductor engaging first end and a pin engaging second end, the first ends of said first terminals opening in one direction and the first ends of said second terminals opening in the opposite direction, said first and second terminals being inserted alternately into adjacent passages in a direction normal to the axis of said passage so that said first ends are accessible from the respective sides of said connector and said second ends are accessible only from the mating face.

4,506,941
SOCKET INCORPORATING SERIALLY COUPLED SPRINGS

Jerry I. Tustaniwskyj, Mission Viejo, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 23, 1983, Ser. No. 554,316
Int. Cl.³ H01R 13/62
U.S. Cl. 339—75 M 11 Claims

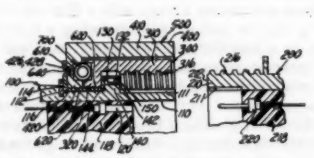


1. A socket for an integrated circuit package, comprising:
a frame;
a plurality of mechanical contacts having a spring rate K_{eff} mounted in said frame such that they align with corresponding pins on said package;
a contact deflecting member in said frame which is moved to engage and deflect said contacts against said pins;
an actuator in said frame which is manually moved to move said contact deflecting member from an open position where each contact is not deflected against a pin to a closed position where each contact is nominally deflected against a pin by a nominal force F_{nom}; and
a spring in said frame having a per contact spring rate of K_B which engages and is deflected by said actuator;
said spring being mounted to deflect in series with said contacts so that the force with which each contact pushes against a pin in said closed position is proportional to $F_{nom}+K_{eff}K_B(K_{eff}+K_B)^{-1}X$ where X is the cumulative dimensional tolerance of the components in said socket.

4,506,942
ANTI-DECOUPLING MECHANISM FOR ELECTRICAL CONNECTOR

Mark Fiederbach, Harbor City, Calif., and David O. Gallusser, Oneonta, N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 2, 1982, Ser. No. 446,820
Int. Cl.³ H01R 13/639
U.S. Cl. 339—89 M 8 Claims

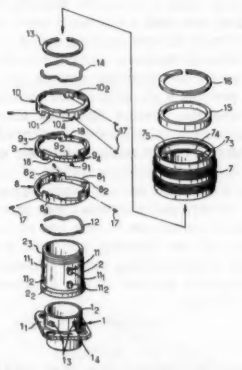


1. An anti-decoupling mechanism for an electrical connector assembly of the type having a pair of cylindrical shells and a coupling member, one of said shells including a rear face arranged annularly and extending radially outwardly thereabout and the other of said shells having external thread on the outside surface thereof, said coupling member comprising a cylindrical coupling sleeve and an inward radial flange, said coupling sleeve being rotatably mounted about said one shell and provided with an internal thread adapted to engage the external thread so that when said threads are engaged by rotation by the coupling member in one direction the coupling member draws the shells together, said anti-decoupling mechanism characterized by:
a second radial flange rotatably mounted about said one shell, said second radial flange being disposed adjacent the other radial flange and mounted for relative rotation therewith between first and second angular positions;
containing means for containing the radial flanges in confronting relation, said containing means being adapted to be driven into tight non-rotating relation against the rear face of said one shell by the other radial flange to establish the first angular position when the coupling member has been fully coupled to said other shell by an external coupling force;
biasing means for biasing the flanges to resist relative rotation of the radial flanges; and
retaining means for retaining the second radial flange in said second angular position when rotated thereto by the external coupling force, whereby when an uncoupling force is applied to the connector assembly which might tend to disturb the tight abutting relation between the containing means and the rear face, said bias means drives the first radial flange and the threaded coupling sleeve in the opposite and coupling direction whereby uncoupling rotation is resisted.

4,506,943
ELECTRIC CONNECTOR

Pierre L. M. Drogo, 104, rue Garibaldi, Saint Maur (Val de Marne), France

Filed Jul. 29, 1983, Ser. No. 518,424
Claims priority, application France, Feb. 18, 1983, 83 02696; Jul. 11, 1983, 83 11513
Int. Cl.³ H01R 13/625
U.S. Cl. 339—90 R 21 Claims



1. In an electrical connector of the type having
(a) a first cylindrical member,
(b) a second cylindrical member, one of the cylindrical members being a plug having a plurality of protruding pins, the other cylindrical member being a jack having a plurality of sockets for receiving the pins,
(c) means for aligning the pins of the plug with the sockets of the jack, and
(d) lock means for drawing the aligned plug and jack together and holding them locked together by rotation of a lock element, the improvement wherein the lock means comprise
(i) a first outer ring having a cam surface,
(ii) a second outer ring having a cam surface,
(iii) a middle ring situated between the two outer rings, the middle ring having a cam surface facing the cam surface of the first outer ring and a cam surface facing the cam surface of the second outer ring, the cam surfaces being arranged upon relative rotation between the middle

ring and the two outer rings to cause the middle ring and one of the outer rings to move apart and simultaneously cause the middle ring and the other outer ring to move closer together whereby the total height of the three rings remain substantially unchanged.

4,506,944

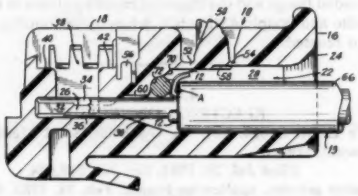
MODULAR CONNECTOR FOR TERMINATING EMI/RFI SHIELDED CORDAGE AND CORD TERMINATED THEREBY

Robert J. Brennan, Ossining, and Terrence Meighen, Stormville, both of N.Y., assignors to Stewart Stamping Corporation, Yonkers, N.Y.

Continuation-in-part of Ser. No. 512,375, Jul. 11, 1983,. This application Jan. 16, 1984, Ser. No. 570,805

Int. Cl.³ H01R *13/658*

U.S. Cl. 339—143 R **8 Claims**



1. A modular plug connector for terminating a shielded cord having a plurality of insulated conductors enclosed within an outer jacket and a conductive shield between the jacket and conductors and enclosing the latter substantially along their length, comprising: a dielectric housing having side walls, a forward free end and a rearward cord input end having an aperture formed therein opening into a cord-receiving cavity formed within the housing, said cord-receiving cavity having a forward conductor-receiving portion and a rearward jacket-receiving portion, a plurality of flat contact terminal openings for receiving flat contact terminals adapted to electrically engage respective ones of the cord conductors; an opening formed through one of said housing side walls which opens at one of its ends at the exterior surface of said housing side wall and at the other of its ends at a fully open region of the cord-receiving cavity; and a contact pin extending through said opening, said contact pin having one end exposed at the exterior surface of said housing side wall and a shank situated within said cord-receiving cavity adapted to electrically engage an exposed portion of the conductive cord shield to terminate the same.

4,506,945

HOLOGRAM APPARATUS FOR DETECTING FLAWS WITH DEVELOPING CHAMBER

John W. Newman, Wayne, Pa., assignor to Laser Technology, Inc., Norristown, Pa.

Division of Ser. No. 284,634, Jul. 20, 1981, Pat. No. 4,462,668, which is a continuation of Ser. No. 194,343, Oct. 6, 1980, abandoned. This application May 14, 1984, Ser. No. 598,183

Int. Cl.³ G03H *1/04*

U.S. Cl. 350—3.6 **33 Claims**

1. Hologram apparatus for detecting flaws comprising:

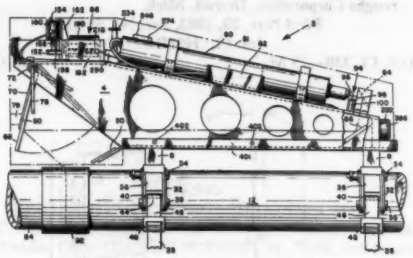
a photographic station,

said photographic station having means for forming with the emulsion side of a photographic film a substantially circular developing chamber having a transparent face opposite the emulsion side of the film, said chamber having a depth in the range of from about 0.005" to about 0.080",

means for supplying to and removing from the chamber a liquid for processing the film,

means for mounting the photographic station with its transparent face opposite an article to be tested,

means for directing a laser beam to the article for reflection of the beam from the article and through the transparent face of the chamber to the film, and



means for directing a reference beam through said face to the film.

4,506,946

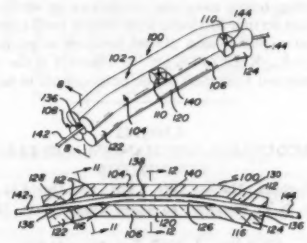
OPTIC FIBER COUPLING GUIDE, METHOD OF MAKING THE SAME AND METHOD OF USE

Malcolm H. Hodge, Claymont, Del., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 838,350, Sep. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 758,106, Jan. 10, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 968,045

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **55 Claims**



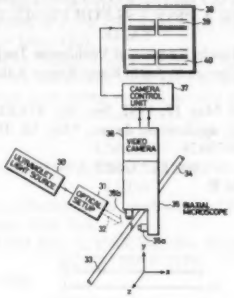
39. A connector comprising a guide for use in making an optical signal transmissive connection between the ends of two optic fibers and having a body with a fiber-receiving channel extending therein; said channel including a first channel portion and an adjacent channel portion at each end of said first channel portion; means for positioning optic fibers to be connected in said channel substantially axially of said connector; said adjacent channel portions being so oriented relative to said first portion as to guidingly bend portions of optic fibers passing therethrough into said first portion against substantially axially aligned surface portions of said first channel portion whereby the ends of two, substantially axially extending optic fibers inserted into said first portion of said channel through said adjacent portions are guidingly bent by said adjacent portions into alignment with one another on said surface portions of said first channel portion to form a good light transmissive connection therebetween; the orientation of said adjacent channel portions relative to said first portion causing a portion of an optic fiber located immediately outside each of said adjacent portions to be at an angle to the longitudinal axis of the channel first portion and form a fiber bow whereby attempted insertion of an additional fiber length into said guide after abutment of the ends of said fibers in said guide channel first portion will result in formation of strain relief bows exteriorly of said guide by further curvature of said bows.

4,506,947

METHOD AND APPARATUS FOR CORE ALIGNMENT OF OPTICAL FIBERS

Koichi Tatekura; Hitoshi Yamamoto; Makoto Nunokawa, and Yoshihiro Ejiri, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,821
Claims priority, application Japan, Nov. 18, 1981, 56-183868
Int. Cl.[3] G02B 7/26
U.S. Cl. 350—96.21 6 Claims



1. A method of aligning two optical fibers in the splicing of said fibers, each of said fibers comprising an elongated core having a dopant therein which causes the core to fluoresce and emit light of a wavelength in the visible region when illuminated with ultraviolet light, and each of said fibers further comprising an undoped cladding material surrounding said core which does not so fluoresce when illuminated with ultraviolet light, said method comprising the steps of positioning said two fibers so that the free ends of the fibers to be spliced are disposed in closely adjacent facing relation to one another, projecting ultraviolet light onto both of said fibers to illuminate the completc cross section of the cores as well as the surrounding cladding material of both of said fibers, simultaneously visually monitoring the free ends of both of said two fibers by use of the visible light that is emitted by the cores of said fibers to determine the positions of said free ends relative to one another, and moving at least one of said free ends of said two optical fibers while effecting said simultaneous visual monitoring step to bring the cores of said two fibers into accurate alignment with one another.

4,506,948

CABLE STRAIN MONITORING

Colin S. Parfree, and Peter Worthington, both of Southampton, England, assignors to International Standard Electric Corporation, New York, N.Y.

Division of Ser. No. 206,427, Nov. 13, 1980, Pat. No. 4,350,046.
This application Jun. 14, 1982, Ser. No. 388,380
Claims priority, application United Kingdom, Nov. 15, 1979, 7939607
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.23 4 Claims

1. An optical fibre cable comprising:

a plurality of optical fibres each having a core surrounded by a cladding, each of said fibers having an outer sheath; and

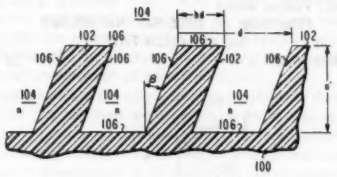
at least one metallic element having a sheath, said element having an electrical resistance which is variable gradually with the strain to which the element is subjected for indicating the strain applied to the optical fibers, and said sheath having an outside diameter substantially the same as the outside diameter of each of said sheathed optical fibres.

4,506,949

DIFFRACTIVE COLOR SEPARATION FILTER

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1983, Ser. No. 498,763
Int. Cl.[3] G42B 5/18
U.S. Cl. 350—162.19 11 Claims



1. A diffractive color separation filter responsive to illumination with polychromatic input light having a given spectrum of free-space wavelength λ for deriving respective angularly-separated zero diffraction order, plus-one diffraction order, and minus-one diffraction order output light beams, wherein the wavelength spectrum of each of said respective output light beams is significantly different from one another, said filter comprising;

a phase grating defined by periodically-spaced rhomboid-shaped diffraction elements having a spacing period d, an optical amplitude a, an aspect ratio b and a slant angle β with respect to the normal to said grating, wherein the respective values of λ, d,a,b, and β are related by the following expressions:

$2<d/\lambda<6$

$0.5<a/\lambda<5$

$0.1<b<0.9$

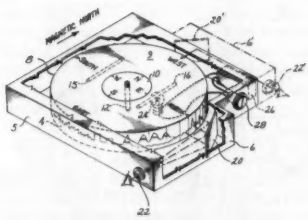
$0<\beta<2\lambda/d$.

4,506,950

VIEWING DEVICE

Richard B. Crossman, 2451 Second Ave. W., Seattle, Wash. 98119

Filed Feb. 28, 1983, Ser. No. 446,570
Int. Cl.[3] G02B 27/02; G02F 11/02
U.S. Cl. 350—238 7 Claims



1. A viewing device which comprises:

a. magnetic compass means comprising a bearing means and at least one magnet mounted in conjunction therewith so that the compass means is free to seek the magnetic pole;

b. a case having supporting means for the compass means;

c. a photograph formed into a drum attached to the compass means so that the vertical axis of the drum is coincident with the axis of rotation of the compass, said photograph being a mirror-image representation shown on the outside of the drum; and

d. viewing means for the photograph, said means comprising a mirror and magnifying lens, so that a person observing

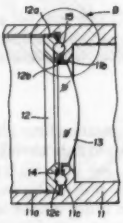
the photograph and facing in a given compass direction will see essentially the same view that would be seen by an observer standing at the point at which the photograph was taken and facing the given compass direction.

4,506,951

PLASTIC LENS

Noboru Yamada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,080
Int. Cl.³ G02B 7/02
U.S. Cl. 350—253 **25 Claims**



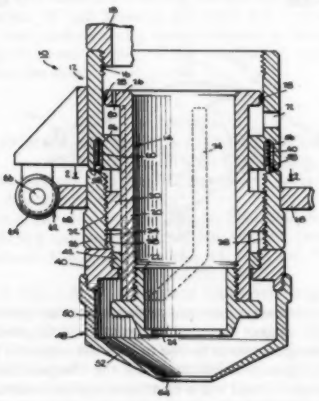
1. A plastic lens for mounting in a lens mount by a hold ring both made of material having a different linear expansion coefficient from that of the lens, comprising: a lens body having an effective optical diameter, a thin portion integral with the lens body radially outside the effective diameter of the lens body and being thinner than the minimum thickness of the lens body, and an end portion integral with the lens body radially outside from and thicker than the thin portion and configured to be removably held between the lens mount and the hold ring, whereby said thin portion is effective to absorb internal stress produced in the lens.

4,506,952

LENS MOUNT

Everett C. Grollimund, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 30, 1982, Ser. No. 404,349
Int. Cl.³ G02B 7/04
U.S. Cl. 350—255 **8 Claims**



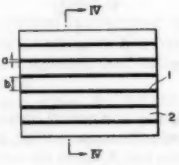
1. A lens mount comprising:
support means having a threaded portion; and
a lens holder supported by said support means, said lens holder having a threaded portion threadedly engaging said threaded portion of said support means, the threaded portion of said lens holder and the threaded portion of said support means being shaped to provide line-to-line to slight positive interference therebetween; and one of said support means and said lens holder including a resilient portion enabling said threaded portion of said lens holder to engage said threaded portion of said support means with substantially zero clearance and without backlash.

4,506,953

REFLECTION PREVENTIVE LIGHT-SHIELDING SCREEN AND A PROCESS FOR PRODUCING THE SAME

Kunio Shimizu; Yuichi Kame, and Yoshimasa Tsuji, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1982, Ser. No. 378,813
Claims priority, application Japan, May 18, 1981, 56-73423; May 18, 1981, 56-73424
Int. Cl.³ G02B 5/00
U.S. Cl. 350—276 R **18 Claims**



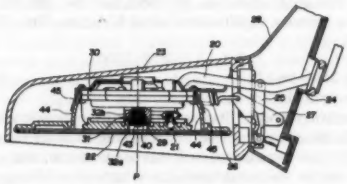
1. A reflection preventive light-shielding screen comprising a transparent plate and a plurality of relief lines of a cured photopolymerized resin composition supported by said transparent plate on its surface, said plurality of relief lines being arranged at spaced intervals with side surfaces and having at least their respective side surfaces roughened, said cured photopolymerized resin composition containing a delustering agent.

4,506,954

MOTOR-DRIVEN REMOTE CONTROL MIRROR DEVICE WITH SHAFT PORTION PIVOT NOT COINCIDENT WITH SHAFT AXIS

Masao Enomoto, Isehara, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

PCT No. PCT/JP82/00404, § 371 Date Jun. 3, 1983, § 102(e) Date Jun. 3, 1983, PCT Pub. No. WO83/01232, PCT Pub. Date Apr. 14, 1983
PCT Filed Oct. 8, 1982, Ser. No. 503,140
Claims priority, application Japan, Oct. 9, 1981, 56-149568[U]
Int. Cl.³ G02B 7/18
U.S. Cl. 350—634 **1 Claim**



1. A motor-driven remote-control mirror device, comprising:
a mirror body (22) supporting a mirror (21) and which is

supported itself for angular movement within a mirror shell (23);

electric motors (5) as drive for said mirror (21), which are fixed within said mirror shell (23); and

means to convert the rotation of the motor (50) to linear motion and to convey it to the mirror body (22), said means being comprised of a gear mechanism (53) mechanically coupled with said motor (50);

a shaft (57) fixed to said gear mechanism (53) and provided with a spiral recess in which a hair pin-shaped spring (62) is engaged; and

a pivot (55) formed as extended from one end of said shaft (57) and fitted in a seat (54) formed on the rear surface of said mirror body (22);

said pivot being disposed with the center thereof not coincident with the axis of said shaft (57), so that said shaft (57) is prevented from being rotated around the axis thereof.

4,506,955

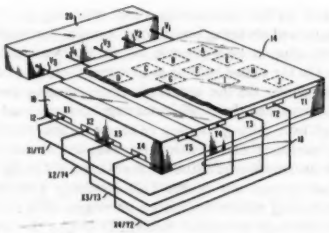
INTERCONNECTION AND ADDRESSING SCHEME FOR LCDS

Allan R. Kmetz, Chatham, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 6, 1983, Ser. No. 492,458

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—336 **7 Claims**



1. Display apparatus comprising:

a planar liquid crystal device including a plurality of (N−1) row electrodes on one side thereof and a plurality of (N−1) column electrodes on an opposing side thereof, said row electrodes overlapping said column electrodes in different spatial planes so as to define an array of M liquid crystal elements;

said row electrodes being interconnected with said columnn electrodes so that said array is addressable via N row electrodes, where $M=(N-1)N/2$,

the n-th row and n-th colum of said array each containing (N−n) of said elements and one element in common, where n=1,2, . . . (N−n),

the x-th column electrode (x=1,2, . . . N−1) being connected to the y-th row electrode, where $y=N+1-x$, and

signal means connected to said N row electrodes for addressing said elements.

4,506,956

MULTICOLOR LIQUID CRYSTAL DISPLAY WITH A DEAD FRONT

Gary A. Dir, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 29, 1983, Ser. No. 480,162

Int. Cl.³ G02F *1/133*

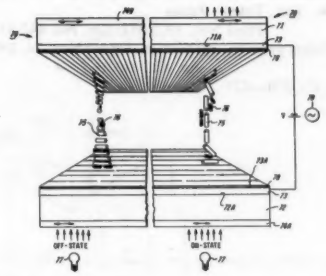
U.S. Cl. 350—339 F **19 Claims**

12. A method of providing a multicolor liquid crystal display device selectively capable of being in the on-state or off-state condition and having a uniformly dark, dead-front output panel when in the off-state condition, said method comprising the steps of:

providing a liquid crystal cell having a pair of parallel, transparent glass substrates with transparent electrodes on their confronting surfaces, and a twisted nematic liquid crystal material contained between the substrates;

attaching high extinction ratio polarizers on each of the substrate surfaces opposite the confronting ones, the polarizing axes of both polarizers being either parallel or orthogonal with the direction of molecules of the liquid crystal material adjacent the substrate surface selected as the input substrate which is to receive light from a light source, said polarizers having an extinction ratio which enables the attainment of a contrast ratio of greater than 100 from the liquid crystal cell during passage of the main vector component of polarized light;

admixing a relatively small amount of dichroic dye with the liquid crystal material to form a guest-host mixture of liquid crystal and dye molecules, the amount of dichroic dye being sufficient to absorb an orthogonal vector component of polarized light created by the imperfect rotation



of the polarized light by the orientation of the twisted nematic liquid crystal molecules when no electric field is present;

directing light from a source having a relatively uniform spectral content toward said polarizer on the input substrate so that the light received by the input substrate is polarized;

applying an alternating current voltage across the electrodes to change the orientation of the molecules of mixture and enable the passage of light when the passage of light is desired; and

inserting a luminance balanced multicolor mask between said light source and said polarizer on the input substrate of the liquid crystal cell, so that the liquid crystal cell with the dichroic dye and two high extinction ratio polarizers in combination with the luminance balanced color mask cause said output panel to appear uniformly dark to an observer when said multicolor liquid crystal display device is in the off-state condition.

4,506,957

LIQUID CRYSTAL MATERIALS CONTAINING PLEOCHROIC ANTHRAQUINONE DYES

Kenneth J. Harrison; Edward P. Raynes, both of Malvern Link; Frances C. Saunders, Malvern Wells; David J. Thompson, Manchester, and David F. Newton, High Compton, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 6, 1983, Ser. No. 482,711

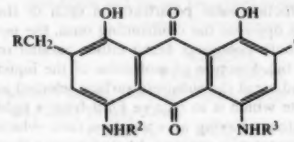
Claims priority, application United Kingdom, Apr. 7, 1982, 8210345; Aug. 18, 1982, 8223852

Int. Cl.³ C09K *3/34;* C02F *1/13*

U.S. Cl. 350—349 **36 Claims**

1. A material suitable for a guest-host liquid crystal device comprising a solution of a liquid crystal material and a pleochroic dye characterised in that the dye comprises at least one

anthraquinone compound free from water-solubilising and ionic substituents and having the formula:



Formula I

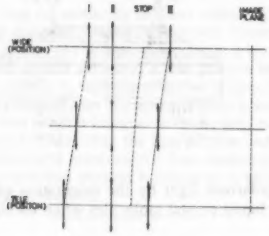
wherein each of R and R^1 independently represents an n-alkyl group having from 4 to 7 carbon atoms inclusive and wherein each of R^2 and R^3 is independently selected from hydrogen and alkyl groups having from 1 to 4 carbon atoms inclusive.

4,506,958

COMPACT ZOOM LENS SYSTEM

Toshihiro Imai, Hachiooji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,414
Claims priority, application Japan, Nov. 24, 1981, 56-186871
Int. Cl.³ G02B *7/04*
U.S. Cl. 350—427 **8 Claims**



1. A zoom lens system

consisting of, in order from the object side, a first lens group located in the foremost position and having positive refractive power, a second lens group located in a position subsequent to said first lens group and having negative refractive power, and a third lens group located subsequent to said second lens group and having positive refractive power, said zoom lens system being zoomed from a wide position to a teleposition by keeping said second lens group fixed with respect to an image surface, and moving said first lens group and said third lens group respectively toward the direction away from the image surface independently of each other by individually different amounts of movements, said zoom lens system being focused on an object at an infinite distance up to an object at a short distance by moving only said first lens group toward the direction away from the image surface.

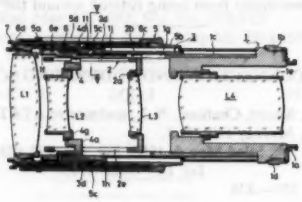
4,506,959

ZOOM LENS ASSEMBLY WITH SWITCHING MECHANISM FROM OR TO ZOOMING PHOTOGRAPHING TO OR FROM MACRO PHOTOGRAPHING

Yoshihiro Hama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,943
Claims priority, application Japan, Dec. 29, 1981, 56-197535[U]
Int. Cl.³ G02B *7/10, 15/10*
U.S. Cl. 350—430 **16 Claims**

1. In a zoom lens assembly having a zoom lens, a mount securing lens barrel which is to be secured to a camera body, an actuation ring capable of linearly moving in an optical direction for zooming and of rotating for focusing, with respect to the mount securing lens barrel, and a convert ring which linearly moves along the mount securing lens barrel without rotating at the zooming operation of the actuation ring to move the zoom lens in order to effect zooming photographing and which rotates together with the actuation ring with respect to the mount securing lens barrel to move the zoom lens in order to effect macro photographing when the actuation ring rotates past the shortest object distance position of the zoom lens at one zooming end postion, an apparatus for converting of zooming photographing to macro photographing and vice versa comprising an arrangement in which the convert ring is fitted on the periphery of the mount securing lens barrel and the actuation ring is closely fitted on the convert



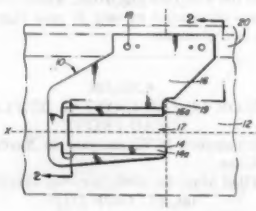
ring, and further comprising a ball retaining groove provided on the mount securing lens barrel, a radial through hole on the convert ring, a ball capable of omni-directional rotation is located in the radial hole so as to move therein, a ball receiving hole provided on the actuation ring, wherein said ball is located between the ball retaining groove and the radial through hole during rotating of the actuation ring for focusing at one zooming end position thereof, to prevent the convert ring from rotating relative to the mount securing lens barrel, said ball comes out ot the ball retaining groove when the actuation ring rotates for macro photographing so that the ball comes between the radial through hole and the ball receiving hole to make the convert ring integral with the actuation ring in order to make a relative rotation of the convert ring to the mount securing lens barrel possible.

4,506,960

FERROGRAPHY APPARATUS

Clinton A. Waggoner; Harry P. Dominique; Gary A. Moonie, and Bruce J. Kaye, all of Victoria, Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Sep. 24, 1982, Ser. No. 423,310
Claims priority, application Canada, Dec. 2, 1981, 391390
Int. Cl.³ G02B *21/26*
U.S. Cl. 350—529 **4 Claims**



1. A slide holder for use in conjunction with a microscope, said microscope including a stage upon which a slide is viewed and a lateral bar which is moveable laterally across the stage along the X coordinate axis of said stage, said holder comprising

slide positioning means for positioning a slide for viewing in a horizontal position on said stage, and

integral mounting plate means for attachment of the holder to said lateral bar such that the slide in viewing position is disposed centrally on said stage with respect to the Y coordinate axis and laterally off-set along the X coordinate axis from the center of said stage, to facilitate viewing of the entire slide without repositioning said slide.

4,506,961

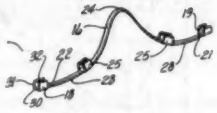
EYEGLASS POSITIONING APPARATUS

Anthony L. Palmieri, 15581 Hanover, Allen Park, Mich. 48101

Filed Sep. 12, 1983, Ser. No. 531,079

Int. Cl.³ G02C *5/12, 5/04*

U.S. Cl. 351—137 **17 Claims**



1. An eyeglass positioning apparatus for use with a pair of eye glasses having a right lense and left lense comprising:

an elongate strap having first and second ends;

first clip means attached to the strap on the first end for slidably securing the first end of the strap to a peripheral portion of the right lense;

second clip means attached to the strap on the second end for slidably securing the second end of the strap to a peripheral portion of the left lense;

said elongate strap including a central portion between the first and second ends adapted to extend over a wearer's nose;

said first and second clip means being slidable outwardly away from the central portion to raise the eyeglasses relative to the wearer's nose, and slidable toward the central portion to lower the eyeglass relative to said wearer's eyes.

4,506,962

CONTACT LENS FOR OBSERVATION OR IRRADIATION OF THE EYE

Philippe Roussel, Wassenaar, Netherlands, assignor to LASAG AG, Thun, Switzerland

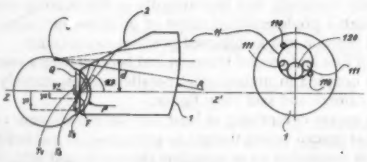
PCT No. PCT/CH82/00018, § 371 Date Aug. 10, 1982, § 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02656, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 8, 1982, Ser. No. 406,930

Claims priority, application Switzerland, Feb. 12, 1981, 931/81

Int. Cl.³ A61B *3/00*; G02C *7/04*

U.S. Cl. 351—160 R **10 Claims**



1. In a contact lens for observing a point in an eye and irradiating said point with a convergent laser beam, said convergent laser beam comprising spherical wave surfaces, said contact lens comprising an entry face having an entry surface, a reflecting plane surface for totally reflecting said beam and an exit face having a substantially spherical concave exit surface, the improvement comprising said entry surface comprising a spherical surface, the center of curvature of which is the image of said point in said reflecting surface to form a wave surface for said beam, whereby said beam passes through said entry face undeviated.

4,506,963

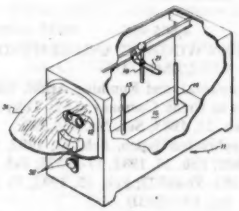
BINOCULAR TRAINER

Clifford W. Cooper, P.O. Box #264, Santa Cruz, Calif. 95061

Filed Dec. 7, 1981, Ser. No. 291,387

Int. Cl.³ A61B *3/08*

U.S. Cl. 351—203 **3 Claims**



1. A device for testing, exercising and enhancing binocular vision comprising in combination,

(a) An enclosure having a pair of viewing aperatures spaced for registry with human eyes through which an interior display space within the enclosure may be viewed,

(b) A first stationary element oriented and positioned in a vertical plane equidistant from each aperature within the display space,

(c) A second stationary element oriented in the same vertical plane as the first element positioned a linear distance from the first element within the display space,

(d) A focus element oriented in the same vertical plane as the stationary elements above the stationary elements within the display space,

(e) Means for moving the focus element back and forth in the vertical plane from above one stationary element to above the other.

4,506,964

LENS ATTACHMENT FOR MULTIPLE IMAGING AND VIGNETTING

David C. Hayles, 11403 Sagestanley, Houston, Tex. 77089

Continuation-in-part of Ser. No. 302,291, Sep. 3, 1981, Pat. No. 4,423,939. This application Mar. 23, 1982, Ser. No. 361,000

Int. Cl.³ G03B *41/00*

U.S. Cl. 354—122 **13 Claims**

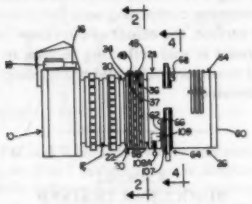
1. A multiple imaging attachment to be utilized with a camera to selectively expose a film frame including:

a housing having an opening formed therethrough for allowing light to be transmitted longitudinally therethrough to expose the film frame;

means, having an opening formed therein, for masking the opening in the housing and for transmitting light to first selected portions of the film frame to allow exposure of said first selected portions;

means for moving the masking and light transmitting means along a predetermined diagonal path across the film frame

so that light can be transmitted to allow exposure of second selected portions of the film frame; and



means for rotating the masking and light transmitting means so that light can be transmitted to allow exposure of third selected portions of the film frame.

4,506,965

MOTOR-DRIVEN WINDING AND REWINDING CAMERA

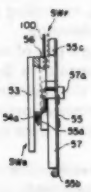
Tomoya Kitajima, Kawasaki, and Kunihiko Araki, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,393

Claims priority, application Japan, Feb. 22, 1982, 57-27195; Feb. 23, 1982, 57-27800; Feb. 25, 1982, 57-29575; Feb. 25, 1982, 57-29576; Feb. 25, 1982, 57-29577; Feb. 25, 1982, 57-29578

Int. Cl.³ G03B *1/18*

U.S. Cl. 354—173.1 **18 Claims**



1. A photographic camera for automatically winding a film loaded therein to a spool and rewinding said film from said spool on a frame by frame basis, comprising:

a driving motor which is driven to rotate in a first direction which corresponds to a winding direction of said film and driven to rotate in a second direction which is opposite to said first direction and corresponds to a rewinding direction of said film;

first power transmission means having a first end operatively connected to said driving motor for transmitting a driving power received from said driving motor to its second end;

second power transmission means having a first end operatively connected to said second end of said first power transmission means and a second end connected to a first shaft of said camera, said spool being rotatably mounted on said first shaft;

third power transmission means having a first end and a second end which is in power transmitting relation with said second end of said first power transmission means and operatively connected to engageable means for engaging a second shaft around which said film is initially wound; and

first clutch means for operatively connecting said second end of said first power transmission means to said first end of said third power transmission means when said motor is driven to rotate in said second direction and disconnecting said second end of said first power transmission means from said first end of said third power transmission means when said motor is driven to rotate in said first direction.

4,506,966

SHUTTER RELEASE DEVICE FOR AUTOFOCUSING CAMERA

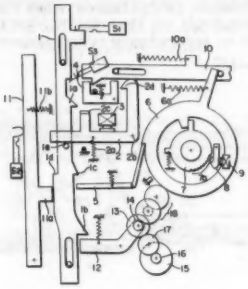
Takao Kuge, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,263

Claims priority, application Japan, Oct. 8, 1981, 56-159525; Oct. 8, 1981, 56-159526

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—195.1 **8 Claims**



1. A shutter release device for an autofocusing camera comprising:

a. operating means movable from an initial position to a first position, and from said first position to a second position;

b. first release means connected to said operating means for releasing a focus adjustment member upon movement of said operating means to said first position;

c. said focus adjustment member having first lock means for holding a shutter operating member in a first locked condition, and for releasing said shutter operating member from said first locked condition upon release of said focus adjustment member;

d. second lock means controlled by an electromagnet for holding said shutter operating means in a second locked condition; and

e. second release means actuated by movement of said operating means to said second position for causing said electromagnet to release said second lock means, whereupon said shutter operating member is released for shutter operating movement.

4,506,967

APPARATUS FACILITATING THE AIMING FOR VIEW FINDER

Veri N. Barzee, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,731

Int. Cl.³ G03B *13/10*; H04N *5/30*

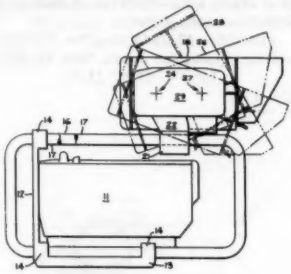
U.S. Cl. 354—223 **7 Claims**

1. Apparatus for mounting a view finder on a television camera, said apparatus being of the type including trunnion and bearing means, the trunnion means serving to pivot the view finder upwardly and downwardly in the bearing means and through a predetermined range of positions including an extended position and a collapsed position, comprising:

a pair of first and second trunnion and bearing means assemblies coupled in mutual axial parallelism respectively to said camera and said view finder;

linking means comprising at least one linking element coupled at spaced points thereof to said trunnion and bearing means assemblies so as to define therewith and with said camera and said view finder a generally Z-shaped assembly having extended and collapsed positions within said trunnion range;

braking means for each of said trunnion and bearing means assemblies, each of said braking means being loaded to hold said view finder in any of the positions within said range thereof, while permitting selective manually induced movement of the view finder to any other of said positions; and



means for selectively releasing at least one of said braking means at a time to facilitate said manually induced movement of the view finder.

4,506,968

PHOTOGRAPHIC CAMERA AND INTERCHANGEABLE LENS FOR USE THEREWITH

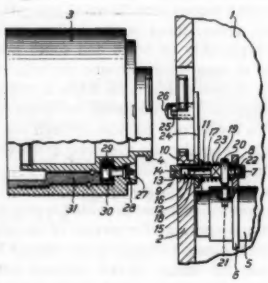
Herbert Machmerth, Solms, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 532,904

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234725

Int. Cl.³ G03B *3/00, 17/14*

U.S. Cl. 354—286 **10 Claims**



1. Photographic camera comprising:

a camera body;

a releasable safety retaining catch on said camera body for attachable interchangeable lens objectives;

a drive shaft on said camera body for the transmission of rotary motions to an interchangeable lens objective attached to the caera body, wherein the drive shaft comprises two part shafts connected such that they are not rotatable relative to each other but are axially slidable with respect to each other;

a drive for operationally connecting an automatic focusing mechanism to the drive shaft;

a spring biasing the drive shaft in the axial direction;

a fixed bearing bushing mounted in the camera body and supporting a rear portion of the drive shaft;

a connection flange on the camera body for mounting an interchangeable lens objective, a forward portion of said drive shaft being supported in said connection flange and protruding beyond the connection flange, the forward portion being provided as a coupling element; and

an interchangeable lens objective comprising a connection base and a coupling piece recessed in the connection base, said coupling piece having a forward end formed complementary to said coupling element of the drive shaft, whereby when said lens objective is attached to said camera body, said coupling element engages said coupling piece.

4,506,969

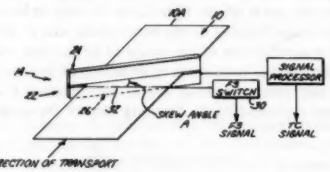
FILM-WIDTH AND TRANSMITTANCE SCANNER SYSTEM

Richard W. Baker, Anoka, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Apr. 2, 1984, Ser. No. 595,995

Int. Cl.³ G03D *13/00*; G01B *11/04*

U.S. Cl. 354—298 **33 Claims**



1. A control system for automatic replenishment in a film processor, the processor containing a plurality of tanks, a transport system for moving the film along a transport path through the tanks, and means for providing replenishment as a function of replenishment control signals, the control system comprising:

means for producing a scanner signal which is a function of transmittance in a field of vision which is oriented at a skew angle A with respect to a direction transverse to film movement, where A is greater than 0° and less than 90°, the scanner signal exhibiting a change when a leading edge of the film first enters the field of vision and a change when a trailing edge of the film leaves the field of vision;

means positioned at a predetermined location along the transport path with respect to the field of vision for indicating when the leading edge of the film reaches the predetermined location and when the trailing edge of the film leaves the predetermined location;

means for measuring a first elapsed time from when the leading edge reaches the predetermined location to when the leading edge enters the field of vision;

means for measuring a second elapsed time from when the leading edge reaches the predetermined location until the trailing edge leaves the predetermined location;

means for measuring a third elapsed time from when the trailing edge leaves the predetermined location to when the trailing edge leaves the field of vision;

means for determining film width as a function of the first elapsed time, the third elapsed time, the skew angle A, and film transport speed;

means for determining film length as a function of the second elapsed time and the film transport speed; and

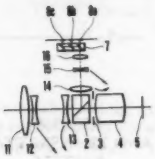
means for producing the replenishment control signals as a function of the film width, the film length of the scanner signal.

4,506,970

FOCUS DETECTION DEVICE

Kazuo Fujibayashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 505,073
Claims priority, application Japan, Jul. 9, 1982, 57-120309; Jul. 9, 1982, 57-120310
Int. Cl.³ G03B 3/00
U.S. Cl. 354—406 6 Claims



1. A device for detecting the focusing state of an objective lens, comprising:

splitting means for splitting a light beam from the objective lens into parts;

image forming means for forming an image based on one of the split parts of the light beam by said splitting means, said image forming means being made able to differentiate the magnification of the image to be formed; and

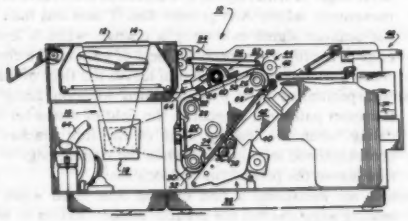
detecting means responsive to detection of the image formed by said image forming means for producing an output signal representing the focusing state of the objective lens.

4,506,971

TRANSFER SYSTEM

Kenneth C. Buell, Fairport, and Thomas F. Cooper, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1978, Ser. No. 962,819
Int. Cl.³ G03G 15/16
U.S. Cl. 355—3 TR 3 Claims



3. An improved apparatus for transferring a toner image charged to a first polarity from a photoreceptor charged to a second polarity to a transfer member, the apparatus comprising:

(a) means for exposing the toner image and photoreceptor to light to at least substantially discharge the photoreceptor around the toner image and to reduce the charge on the photoreceptor holding the toner image on the photoreceptor,

(b) means for depositing a net charge of the first polarity onto the toner image and photoreceptor subsequent to exposure of the toner image and photoreceptor, and

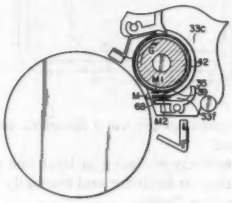
(c) means for transferring the toner image to the transfer member.

4,506,972

DEVELOPING DEVICE WITH MEANS TO PREVENT SCATTERING

Reiji Murakami, Yokohama; Kohachi Uchida, Sagamihara; Yoshitsugu Nakatomi, Yokohama, and Tomohiko Takahashi, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1982, Ser. No. 379,044
Claims priority, application Japan, May 18, 1981, 56-74726
Int. Cl.³ G03G 15/09
U.S. Cl. 355—3 DD 2 Claims



1. A developing device which develops by using a magnetic developer on an electrostatic latent image formed on an image carrier, said developing device comprising:

a body frame having a storage section storing said magnetic developer;

supply means disposed inside the body frame and including a hollow cylindrical rotating body, made of a nonmagnetic material, having a first section facing said storage section and a second section facing said image carrier, and a magnet roller, fitted in the hollow cylindrical body, having a plurality of north and south poles alternately arranged at equal spaces around the roller for generating a shifting magnetic field as the roller is rotated, said supply means supplying the magnetic developer in the storage section to the second section through the shifting magnetic field, whereby the magnetic developer supplied to the second section by said supply means is attracted to the electrostatic latent image on the image carrier; and

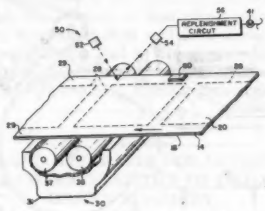
scattering preventive means provided in said frame body for preventing scattering of a portion of the magnetic developer which passes between a nip formed by the supply means and the image carrier without adhering to the electrostatic latent image and which drops from the supply means and thus has no part in the developing operation, said scattering preventive means including a plate member formed of a nonmagnetic material disposed under said supply means for receiving at its top surface said portion of magnetic developer dropped from the supply means,

said shifting magnetic field causing said portion of magnetic developer to move along the top surface of said plate in a first direction until it reaches the edge of said plate whereupon it is transported to the under surface of said plate and said shifting magnetic field causing said portion of magnetic developer to move along the under surface of said plate in a direction opposite to said first direction until it reaches the other edge of said plate whereupon it is transported to the top surface of said plate and as said portion of magnetic developer accumulates on said top surface said shifting magnetic field causes it to collect in said storage section.

4,506,973
TONER CONCENTRATION MONITORING APPARATUS LOCATED BEHIND A TRANSPARENT PHOTOCONDUCTOR

William L. Ernst, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 20, 1983, Ser. No. 506,094
Int. Cl.[3] G03G *15/08*
U.S. Cl. 355—3 DD 4 Claims



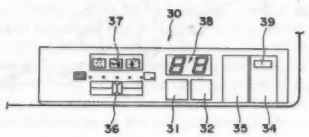
1. In electrographic apparatus comprising a transparent photoconductor having a first surface on which a latent electrostatic image is formed and a second surface, the apparatus further comprising a development station for providing a developer mixture including toner particles to the first surface of the photoconductor for development of the latent image, the improvement comprising:

toner concentration monitoring apparatus comprising an emitting element located to direct a beam of radiation through the photoconductor from the second surface to the first surface and toward an area of the development station where developer mixture is provided to the first surface of the photoconductor, and a detector located adjacent the second side of the photoconductor for receiving radiation emitted by the element and reflected from developer mixture at the first surface of the photoconductor.

4,506,974
COPYING MACHINE

Masamichi Sugiura, Toyokawa, and Kenji Shibazaki, Aichi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1982, Ser. No. 443,145
Claims priority, application Japan, Nov. 21, 1981, 56-187356
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—14 R 16 Claims



1. A copying machine having a drive motor for driving the copying machine, means for generating a start signal for starting said drive motor, auto-shut means for stopping the drive motor a predetermined period of time after the completion of a copying operation, and a mechanism for carrying out a multi-copying operation in which a plurality of copying operations are carried out sequentially, said copying machine comprising:

(a) means for producing a first signal in response to each copying operation;

(b) means for discriminating whether said drive motor is in an on-state or off-state;

(c) means for producing a second signal in response to the generation of said start signal during when said discriminating means discriminates that said drive motor is in an off-state;

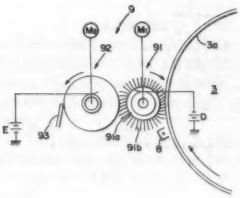
(d) counter means for counting said first and second signals; and

(e) display means for displaying a number counted by said counter means.

4,506,975
CLEANING DEVICE

Katsuhiro Shukuri; Shigeru Inowa, both of Hino, and Kiyoaki Kawamoto, Kunitachi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,380
Claims priority, application Japan, Dec. 24, 1981, 56-208099; Dec. 24, 1981, 56-208100; Dec. 28, 1981, 56-209825
Int. Cl.[3] G03G *15/08*
U.S. Cl. 355—15 8 Claims

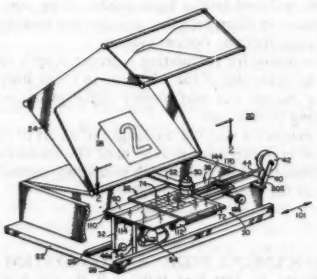


1. A cleaning device for removing toner remaining on an image reproducing surface of an electrostatic reproducing member comprising a rotatable fur brush in contact with the toner-bearing surface of said electrostatic reproducing member, and an electrically biased roller which is made of an electrically conductive body and is disposed in moving contact with said fur brush for removing toner therefrom by electrical attraction, said fur brush having a brush core formed of a conductive material and said brush core being grounded.

4,506,976
MICROFILM INSERTER/VIEWER APPARATUS

Paul A. Kiejzik, 2907 Monterey Ct., Springfield, Pa. 19064

Filed Sep. 19, 1983, Ser. No. 533,809
Int. Cl.[3] G03B *13/28*; B65B *63/00*
U.S. Cl. 355—45 16 Claims



1. An apparatus for loading a film strip segment into a film strip storage jacket comprising:

feed means for propelling a film strip segment along a film strip feed path through the feed means;

holder means adjoining said feed means for positioning a film strip storage jacket to receive the film strip segment from said film strip feed path;

illumination means for illuminating a film strip segment positioned in said film strip jacket; and

means for transmitting an image of the illuminated film strip segment.

4,506,977

TRANSFER APPARATUS PROVIDED WITH AN AUTO-FOCUSING MECHANISM

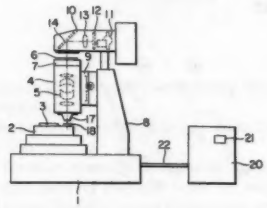
Hiroshi Sato, Tokyo; Shuichi Yabu, Kawasaki, and Masao Kosugi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,812

Claims priority, application Japan, Apr. 14, 1982, 57-62874

Int. Cl.³ G03B *27/42, 27/52*

U.S. Cl. 355—53 **15 Claims**



1. A transfer apparatus for transferring an image on a negative to a photosensitive member, said apparatus comprising:

an exposure device for exposing a photosensitive member to light, said exposure device including negative holding means for holding a negative, photosensitive member holding means for holding a photosensitive member, an image forming optical system for forming the image on the negative onto the photosensitive member, and means for holding the image forming optical system;

illuminating means for producing exposure light to illuminate the negative to expose the photosensitive member through said image forming optical system;

detecting means for detecting the illumination history of said illuminating means and producing a history signal;

length measuring means for measuring the length of at least a part of the optical path of said exposure device between the negative and the photosensitive member and for producing a measured length signal representing the measured length;

means for storing the characteristic of variation in focus of said exposure device, as a function of the illumination history, induced by the light produced by said illumination means to illuminate the negative and passing through said image forming optical system;

operation means for calculating a proper length value from said characteristic of the variation in focus stored in said storing means, and said history signal produced by said detecting means; and

varying means for varying the length of a part of the optical path of said exposure device until the measured length signal measured by said length measuring means becomes equal to the proper length value.

4,506,978

DOCUMENT REGISTRATION SYSTEM

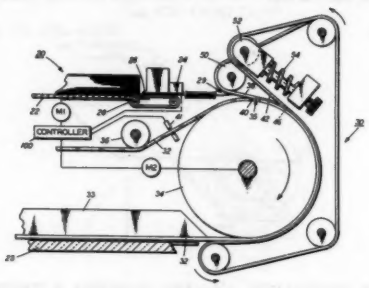
Carmen Allocco, Jr., Pittsford; William R. Burger, Fairport, and Steve S. Counoupas, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 1, 1983, Ser. No. 510,009

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **7 Claims**

1. In a document handling apparatus for registered feeding of document sheets to the imaging station of a copier with a document imaging station transport, and document sheet acquisition and initial registration means for feeding document sheets to said document imaging station transport, the improvement wherein said document sheet acquisition and initial registration means includes a sheet inversion path comprising sheet inverting roller means and spaced plural sheet retaining belt means partially wrapped around said inverting roller means to provide separate document sheet lead edge capturing



nips therewith, and to provide a non-slip document feeding path when a document is held between said plural belt means and said roller means, and means for mounting a central one of said plural belt means differently from the others of said plural belt means for centrally engaging a document sheet in a registration nip with said central belt means prior to engagement of a document sheet in the capture nips of said other belt means.

4,506,979

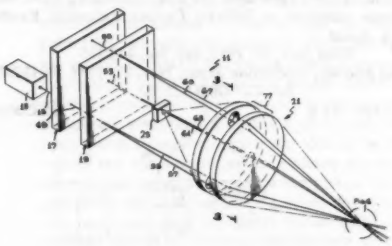
COMPACT RADIATION FRINGE VELOCIMETER FOR MEASURING IN THREE DIMENSIONS

Philip L. Rogers, Granada Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 8, 1981, Ser. No. 328,721

Int. Cl.³ G01P *3/36*; G01J *3/30*

U.S. Cl. 356—28.5 **19 Claims**



1. Apparatus for measuring the three-dimensional velocity of a remotely located object, comprising:

first means for producing simultaneously three sets of non-orthogonal, but linearly independent, three-dimensional patterns of radiation, each of said sets having its own distinguishing characteristic and having a normal vector having a significant component in the direction of the main axis of the system as well as a transverse component at right angles thereto;

second means associated with said first means for projecting said three sets of patterns onto a detection volume, said detection volume being physically separated in space from said apparatus;

third means associated with said second means for focusing

radiation backscattered by said object as it passes through said detection volume onto a detection area contained within said apparatus;

fourth means disposed in the vicinity of said detection area for measuring the intensity of said backscattered radiation;

fifth means responsive to the output of said fourth means and capable of utilizing said distinguishable characteristic for identifying three separate components of said backscattered radiation associated respectively with each of said three sets of radiation patterns; and

sixth means responsive to the output of said fifth means for calculating the velocity of said object relative to said apparatus, wherein at least said first, second, third and fourth means are located in physical proximity to one another, whereby they may all be contained within a single, relatively compact, housing aboard an aircraft.

4,506,980

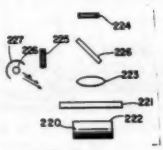
METHOD AND APPARATUS FOR DETERMINING PHYSICAL CHARACTERISTICS OF OBJECTS AND OBJECT SURFACES

Timothy R. Pryor; Omer L. Hageniers; Walter J. Pastorius; Nicholas Liptay-Wagner, and Donald A. Clarke, all of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 15,792, Feb. 27, 1979, Pat. No. 4,305,661. This application Aug. 24, 1981, Ser. No. 295,622

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—237 **3 Claims**



1. A method for determining a physical characteristic of a surface of an object comprising the steps of:

illuminating a surface of an object with light;

imaging a linear strip portion of light from said object surface onto a photodetector array comprising at least one line of photodetector elements;

scanning said array to determine the output of a least some of the elements of said array; and

automatically comparing said output to a known standard output or to other portions of said image to determine a physical characteristic of said object surface;

said method further comprising imaging a wider strip portion of light from said object surface onto a further photodetector array comprising at least one line of elements, said wider strip portion encompassing the axial circumferential zone around said linear strip portion of light, and comparing the output of the arrays to determine surface reflection differences in the circumferential direction.

4,506,981

METHOD FOR DETECTION OF BLOWN BEADS IN PNEUMATIC TIRES

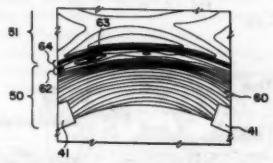
Charles M. Hoff, Jr., Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 14, 1982, Ser. No. 434,213

Int. Cl.³ G01B *9/025*

U.S. Cl. 356—347 **3 Claims**

1. A method for the detection of an area of improper cure in the vicinity of a bead in an elastomeric load supporting member, including the step of generating a holographic interference pattern of the interior of the elastomeric load supporting member, the holographic interference pattern having an ordered pattern of fringe lines produced by the bead, wherein the improvement comprises the step of



determining the existence of a band of fringe lines at the edge of and separated from the ordered pattern of fringe lines produced by the bead, the number of fringe lines in said band being in a range from 3 to 4, inclusive.

4,506,982

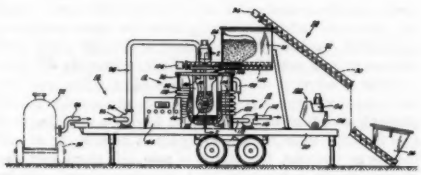
APPARATUS FOR CONTINUOUSLY BLENDING VISCOUS LIQUIDS WITH PARTICULATE SOLIDS

Richard Smithers, Phoenix, and Carl B. May, Glendale, both of Ariz., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 289,244, Aug. 3, 1981, abandoned. This application Aug. 16, 1983, Ser. No. 523,700

Int. Cl.³ B28C *5/16, 7/10, 7/12*

U.S. Cl. 366—19 **24 Claims**



1. An apparatus for continuously blending in a single stage, a viscous fluid with particulate solids to form a substantially homogeneous slurry, which comprises:

(a) an outer tank;

(b) a blending vessel mounted within said outer tank so as to define (1) a blending chamber within said vessel spaced inwardly from the walls of said outer tank and (2) a blended fluid and particulate solid slurry holding chamber around said blending vessel and within said outer tank, said blending vessel being substantially closed except for lower regions which allow fluid communication from said blending chamber into said holding chamber;

(c) a blender comprising (1) a blender shaft rotatably mounted in said blending vessel, (2) a blending disc fixed to said shaft a first selected distance above the bottom of said blending vessel and (3) first and second hollow blending elements, said first element being fixed to said shaft on one side of said disc and said second element being fixed to said shaft on the opposite side of said disc, each of said blending elements having an open larger diameter end thereof facing said disc and being spaced at a second preselected distance from said disc so as to define first and second blending regions between said disc and said first and second blending elements, respectively;

(d) feeding means for feeding said fluid and particulate solids into said blending chamber;

(e) means for rotating said blender to cause blending of said fluid and particulate solids in said blending chamber; and

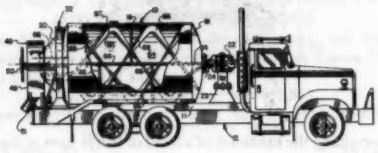
(f) discharging means for discharging said slurry from said holding region.

4,506,983

BULK MATERIAL STORAGE AND MIXING APPARATUS

Leonard D. Marr, 1147 Yorkshire, Carrollton, Tex. 75006

Filed Feb. 1, 1982, Ser. No. 344,384
Int. Cl.³ B28C 5/20
U.S. Cl. 366—44 13 Claims



1. A bulk material storage and mixing apparatus for mixing and discharging a quantity of dry bulk material such as cement, said apparatus comprising:

a frame adapted to be mounted on a transport vehicle;

a cylindrical drum mounted on said frame for rotation about a generally horizontal axis of rotation;

drive means mounted on said frame for rotating said drum;

said drum including a closed head at one end and a generally conical shaped discharge nozzle at the opposite end, said discharge nozzle including a material discharge opening formed in a plane substantially perpendicular to said axis of rotation at one end of said discharge nozzle; and

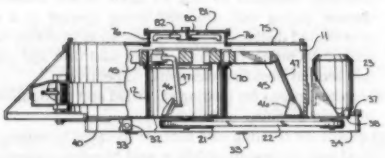
three flights of elongated helical mixing and discharge fins formed on the interior of said drum extending from said head to said discharge opening, said fins being substantially equally spaced apart one from the other and extending generally radially inwardly from the inner surface of said drum, said fins being formed at a helix angle with respect to said axis of rotation of approximately 45° over a major portion of the axial length of said fins, said fins having a discharge portion extending substantially axially through said discharge nozzle and having a helix angle of less than 15° with respect to said axis of rotation at said discharge opening, the width of said fins along said discharge nozzle being such that said fins extend radially inwardly at a constant diameter with respect to said axis of rotation along a major portion of the axial length of said discharge nozzle and sweep an annular area delimited at its inner radius by an axially continuous flow area extending entirely through said discharge nozzle, said flow area being defined by a circle having a radius center on said axis of rotation, and said fins have a negative rake angle of approximately 15° to 30° with respect to a radial line passing through said axis of rotation at said discharge opening for discharging said bulk material uniformly through said discharge opening during rotation of said drum.

4,506,984

PAN TYPE MIXING MACHINE

Robert W. Strehlow, New Berlin, Wis., assignor to Mixer Systems, Inc., Milwaukee, Wis.

Filed Jun. 9, 1983, Ser. No. 502,490
Int. Cl.³ B01F 7/18; B28C 5/16, 7/02, 7/14
U.S. Cl. 366—65 4 Claims



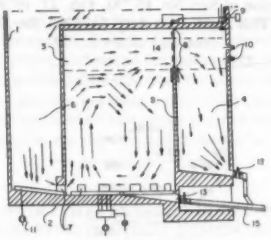
1. In a horizontal, pan type mixing machine having vertical, spaced concentric annular walls defining a mixing chamber therebetween and rotating paddles for stirring the material disposed in said chamber, the inner annular wall describing a central cylindrical well which is open at the bottom and at the top, a horizontal ledge extending inwardly from said wall intermediate of the top and the bottom of the well, said ledge having a central opening, a speed transmission unit having an outer diameter smaller than the opening in said ledge, said transmission having an output shaft extending upwardly through said opening, means connecting said paddles with said output shaft, and a ring bolted to the ledge and supporting said transmission, whereby when the ring is disengaged from the ledge and the transmission, the transmission may be removed either upwardly or downwardly with respect to the well to enable servicing of the transmission in either position.

4,506,985

MIXING CHAMBER SILO FOR LOOSE MATERIAL

Adolf Buchfink, Plano, Tex., assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,477
Int. Cl.³ B01F 13/02
U.S. Cl. 366—107 3 Claims



1. An assembly comprising:

a silo; for storing bulk materials; and

a mixing chamber for bulk materials located on the floor of said silo, said mixing chamber having a principal passage for removal of bulk materials from a central mixing compartment, said passage running radially to an outer wall of the silo, said passage being located at the top of said mixing chamber, said passage is defined by an opening in a wall between said central mixing compartment and a conduit connecting said central mixing compartment to a removal outlet, said opening is provided with a lower edge which can be vertically adjusted, the filling height of said conduit is monitored by measuring means which controls the ventilation of the silo floor outside said mixing compartment, said central mixing compartment has on its floor a second removal outlet through which loose material is removed.

4,506,986

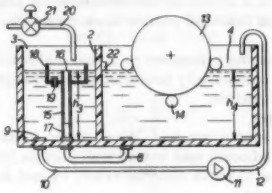
METHOD AND APPARATUS FOR PREPARATING LIQUID MIXTURES

Barrie A. Freeman, Wickford, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sep. 22, 1983, Ser. No. 534,955
Claims priority, application United Kingdom, Oct. 4, 1982, 8228310; Apr. 20, 1983, 8310702
Int. Cl.³ B01F 15/00
U.S. Cl. 366—142 9 Claims

1. A method of preparing liquid mixtures in a first container and in a second container by introducing different amounts of a first and a second liquid into each of said containers, characterised in that a measured quantity of first liquid is introduced into said first container, the first container having side walls, a

base and an outlet spaced from the bottom of the container and the second container having side walls, a base and an inlet, and there being means connecting said outlet of the first container to said inlet of the second container such that liquid can flow under gravity through said outlet into said second container, the measured quantity of first liquid introduced into said first container being greater than the amount which can be retained in said first container, whereby some of said liquid will flow through said connecting means into said second container, the height of said outlet above the base of the first container and



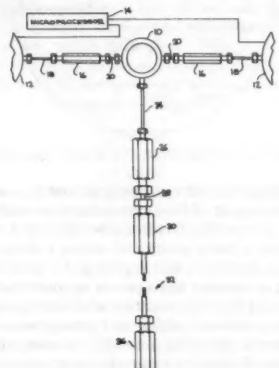
the area of the base of each of said continers being such as to result in a desired distribution of the first liquid between the containers, a hollow tubular extension means having an upper end provided with an overflow outlet and with a mixture-preventing means and a lower end fitted to said outlet and introducing second liquid into said mixture-preventing means to flow firstly into the first container until the latter is filled to the level of the overflow outlet and secondly through said overflow outlet into the second container without substantially mixing with the liquid in the first container.

4,506,987

HIGH PRESSURE LIQUID CHROMATOGRAPHIC GRADIENT MIXER

Christian G. Daughton, San Pablo, and Richard H. Sakaji, El Cerrito, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 8, 1982, Ser. No. 415,946
Int. Cl.³ B01F *5/04, 13/10, 15/02*
U.S. Cl. 366—160 **9 Claims**



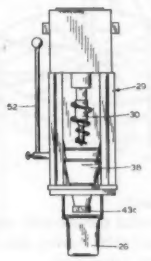
1. A liquid gradient mixer comprising:
a premixing tee adapted to receive liquid under pressure from a plurality of sources;
a premixing chamber operatively connected to receive a liquid mixture from said premixing tee; and
a main mixing chamber operatively connected to receive the liquid mixture from said premixing chamber, said main mixing chamber being provided with means for providing a no center void therein, said means comprising a housing having a plurality of spiral wound wires extending longitudinally through said housing which cause turbulent mixing of the liquid mixture so as to homogenize the liquid mixture discharging therefrom,
said plurality of spiral wound wires being positioned within said housing so as to provide the no center void within said housing.

4,506,988

COMESTIBLE CONVERTING APPARATUS

Claude A. Reed, 4810 S. 136, Omaha, Nebr. 68137

Filed Oct. 31, 1983, Ser. No. 546,974
Int. Cl.³ B01F *7/24*
U.S. Cl. 366—203 **5 Claims**



1. An improved apparatus for converting a solid prefrozen comestible to semi-solid condition comprising:
a. a vertical structural frame;
b. an upper support means affixed to said frame;
c. a lower support means affixed to said frame below said upper support means in a spaced apart relation thereto and having a central opening;
d. a vertically aligned tapered auger rotatably mounted from said upper support member with its tapered most end pointing downwardly;
e. track means connected between said upper and lower support means;
f. a vertically movable saddle means that normally rests upon said lower support means and is associated with and guided by said track means, said saddle means having a body portion with a vertically aligned center bore;
g. linkage means connecting between said structural frame and said saddle means;
h. lever means rotatably mounted from said structural frame and movable to actuate said linkage means and thereby selectively control the vertical elevation of said saddle means from said lower support means;
i. a frusto-conically shaped hopper that receives said frozen comestible and includes an upper large opening and a lower narrow opening, said hopper being seated in the center bore of said saddle member in axial alignment with said auger in such fashion that as the saddle means is elevated by the actuation of said linkage means, the hopper is raised to receive the auger in an operative relationship whereby the outer periphery of the auger is adjacent the interior of the hopper;
j. means for turning said auger about a vertical axis during reception of the auger in said hopper to advance the comestible in the hopper downwardly toward the lower opening thereof;
k. a sanitary receptacle member; and
l. connecting means semi-permanently attached to said lower support member and having lower ends that extend beneath said body portion of said saddle member to releasably engage and hold said receptacle member in a normal

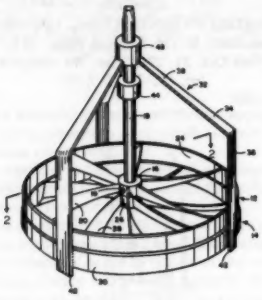
position directly beneath the lower open end of said hopper.

4,506,989

VORTEX MIXER

Carter K. Reh, 13312 Loretta Dr., Santa Ana, Calif. 92705

Filed May 22, 1984, Ser. No. 613,074
Int. Cl.³ B01F 7/22
U.S. Cl. 366—270 **11 Claims**



1. A mixer comprising:

(a) a rotatable propeller subassembly comprising:

(i) a central, power shaft having one end for engagement with a rotational drive; and

(ii) at least one propeller carried on said shaft with a first hub and a plurality of axially pitched radial blades carried thereon and fixedly secured to said shaft at an axial position along its length;

(b) a stator and stator spider subassembly comprising:

(i) a central hub slidably and rotationally received on said shaft;

(ii) a second plurality of axially pitched blades carried by said second hub;

(iii) a cylindrical rim surrounding and fixedly secured to the outer tips of the blades of said second plurality of blades;

(iv) a third hub slidably and rotationally received on said shaft; and

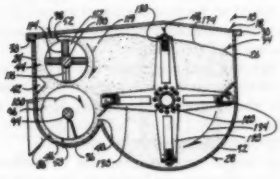
(v) a plurality of arms fixedly interconnected between said third hub and said cylindrical rim.

4,506,990

MIXER FOR FLUENT AND NONFLUENT MATERIAL

Benjamin R. Neier, Ponca City, Okla., and Donald L. Stirling, Ridgetown, Canada, assignors to Stirco Inc., Chatham, Canada

Filed Mar. 30, 1984, Ser. No. 595,264
Int. Cl.³ B01F 7/04, 7/08
U.S. Cl. 366—299 **34 Claims**



1. A material mixer, comprising

a mixer tank including forward and rearward end walls, a bottom wall and opposite side walls,

said bottom wall including a first relatively large curved wall portion defining the bottom of a main chamber, a second relatively smaller curved wall portion defining the bottom of an auxiliary chamber, and an elongated ridge at the junction of said curved wall portions,

a rotor including a plurality of elongated rotor bars adjacent the outer periphery thereof,

means for supporting said rotor in said main chamber for rotation in a direction for movement of said rotor bars across said first wall portion toward said auxiliary chamber,

said rotor having a diameter such that said rotor bars travel in an arc substantially conforming to and adjacent to said first wall portion,

a lower auger,

means for supporting said lower auger in said auxiliary chamber adjacent said second wall portion for rotation in a direction to move material axially of said lower auger,

an upper auger,

means for supporting upper auger in said auxiliary chamber above said lower auger for rotation in a direction to move material axially of said upper auger generally in a direction opposite to the direction of flow of material therebelow by said lower auger, and

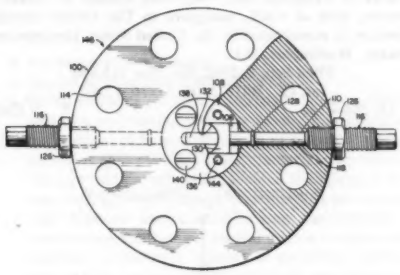
drive means for rotating said rotor and upper and lower augers.

4,506,991

ADJUSTABLE ORIFICE FOR EMULSIFIER

Dannie B. Hudson, 741 Mayflower Dr., Red Bank, N.J. 07701

Filed Jun. 7, 1982, Ser. No. 386,193
Int. Cl.³ B01F 5/06
U.S. Cl. 366—341 **21 Claims**



15. An adjustable orifice assembly for use in an apparatus for homogenizing a pair of fluid components, at least one of said components comprising a hydrocarbon fuel, said orifice assembly comprising a body positioned within a stream of at least one of said components for impeding the flow thereof, said body having an opening and a pair of opposed radially extending passageways in communication with said opening, a pair of control rods positioned within said passageways and having one end thereof extending into said opening opposing one another, a pair of elements removably attached to said one end of said rods and movably positioned in opposed relationship within said opening along the longitudinal axis thereof for defining an orifice between their relative spaced positions, whereby the size of said orifice is adjustable over an operative range for effecting the homogenization of said components by controlling the longitudinal movement of at least one of said rods within said passageways to effect the relative spaced position between said elements within said opening, and a cover removably secured to said body overlying said opening therein, said cover having an aperture arranged in alignment

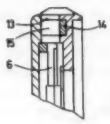
with said orifice defined between the relative spaced position of said elements, said elements being accessible from outside said body upon removal of said cover to permit their removal from attachment to said one end of said rods and to permit the replacement thereof within said opening while said one end of said rods remains extending into said opening.

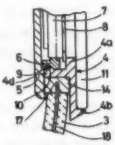
4,506,992

WATCH CASE PROVIDED WITH INTEGRAL BRACELET

Eric Bonnet, La Chaux de Fonds, Switzerland, assignor to Jean Lassale S.A., Geneva, Switzerland

Filed Jul. 5, 1983, Ser. No. 510,978
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—282 **8 Claims**





1. A wrist watch case and integral bracelet comprising:
an annular case body having an annular groove formed in said case body and opening toward the back of said watch case, said case body having an outer peripheral wall outside said groove,
a case body removably affixed to said case body and closing said groove and the back of the watch case,
an anchor ring received in said annular groove and retained in said groove by said case back, and
a flexible, non-metallic watch strap having opposite strap parts attached to said ring at opposite sides of said watch case, said outer peripheral wall of said case body having openings at opposite sides of said watch case of a size for passage of said watch strap parts,
said anchor ring being enclosed in said groove by said outer peripheral wall of said case body and said case back.

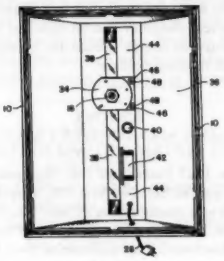
4,506,993

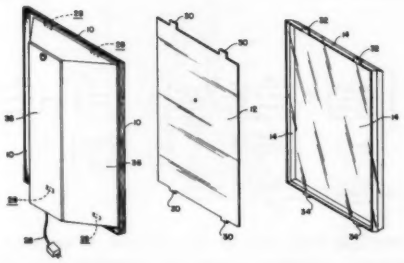
RECTANGULAR FRAMED ADVERTISING DISPLAY CLOCK

John M. Brown, 2600 Lockheed Way, Carson City, Nev. 89701

Filed Sep. 12, 1983, Ser. No. 531,455
Int. Cl.³ G04B *37/00, 19/14*
U.S. Cl. 368—314 **6 Claims**

1. A clock comprising: a rigid frame member having a plurality of slots therein at the top and bottom thereof; a thin resilient plastic panel enclosing the space circumscribed by the frame member and having integral lugs at the top and bottom edges thereof received in the slots in the frame member, said panel having clock indicia formed on the front face thereof; a transparent cover having integral lugs at the top and bottom edges thereof to be received in said slots in said frame member to mount the transparent cover on the frame member with said transparent cover extending across the front face of the panel; a clock motor mounted to the rear of the panel and having a drive shaft extending through the panel; clock hands mounted on the drive shaft in front of the panel for indicating time in conjunction with the clock indicia on the front face of the panel; the lugs at the top of the cover and the lugs at the bottom thereof being dimensioned to permit the lugs at the bottom of the cover to be freed from the slots in the bottom of





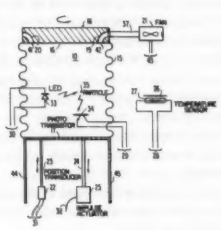
the frame by displacing the cover upwardly with respect to the frame to permit removal of the cover.

4,506,994

DEW POINT MEASUREMENT AND TIME TREND ANALYSIS

Carl E. Schwab, Huntington Station, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 419,884
Int. Cl.³ G01N *25/66*
U.S. Cl. 374—28 **15 Claims**



1. A dew point depression measuring device comprising:
a test chamber with conrollable volume,
first means for introducing air into said chamber at near ambient temperature and pressure conditions,
second means for opening and closing said test chamber to ambient atmospheric conditions,
third means for abruptly expanding said test chmaber in volume after said test chamber is sealed from said atmosphere by said second means,
fourth means for detecting formation of ice or water particles in the test chamber,
and a microprocessor including:
fifth means for recording test chamber volume at the time

said fourth means detects said formation of ice or water particles, and

sixth means for computing dew point based on ambient temperature and said recorded test chamber volume,

whereby said test chamber is controlled in volume, and said second, third and fourth means are coordinated in operation by said microprocessor.

4,506,995

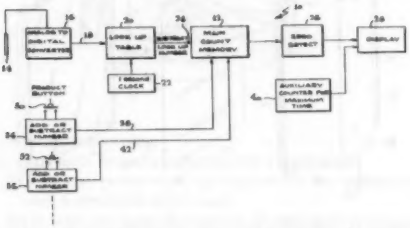
SHORTENING MANAGEMENT METHOD AND APPARATUS

Louis S. Polster, 1017 Fairmount Rd., Burbank, Calif. 91501

Continuation-in-part of Ser. No. 902,986, May 4, 1978, Pat. No. 4,362,094, which is a continuation of Ser. No. 732,214, Oct. 14, 1976, abandoned, which is a continuation of Ser. No. 627,089, Oct. 30, 1975, abandoned. This application Dec. 6, 1982, Ser. No. 447,463

Int. Cl.³ G01N *3/60;* **G05B** *15/02*

U.S. Cl. 374—57 **16 Claims**



1. A shortening management apparatus for signalling the state of degradation of shortening in a cooking apparatus comprising:

a main memory in a computing circuit means, means for setting said main memory with an initial value;

means for sensing the temperature in shortening being managed;

a clock associated with said means for sensing shortening temperature;

proportioning means connected to both said clock and said means for sensing shortening temperature for producing a signal which is related to the time rate of degradation of the shortening at the sensed temperature, said proportioning means being connected to said memory for modifying the value in the memory in accordance with the signal from said proportioning means;

input means connected to said main memory for modifying the value in said main memory upon each actuation of said input means; and

signal means connected to said main memory for producing a signal when the value in said main memory reaches a predetermined value.

4,506,996

CRYOGENIC THERMOMETER

Koichi Nara, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 22, 1983, Ser. No. 477,857

Claims priority, application Japan, Aug. 27, 1982, 57-148588

Int. Cl.³ G01K *7/00, 1/02*

U.S. Cl. 374—176 **8 Claims**

1. A thermometer comprising:

at least one temperature detection unit for setting in position on an object whose temperature is to be measured and comprising a first superconductor,

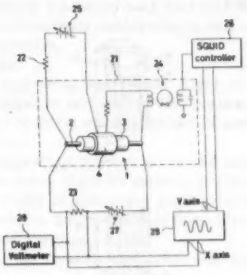
at least one normal conductor wrapped around the periphery of said first superconductor,

at least one second superconductor wrapped around the periphery of said normal conductor,

a first power source connected to one end of said first superconductor and said second superconductor for passing electric current therebetween,

a second power source connected to the opposite ends of said first superconductor for passing electric current therebetween,

a voltmeter connected to the other end of said first superconductor and said second superconductor,



measurement means coupled to said voltmeter for measuring a cryogenic temperature by fixing the value of the level of the electric current from said first power source and for changing the value of the electric current from said second power source, and

determining means coupled to said measurement means for determining the temperature on the basis of the increment change in the electric current from said second power source which is required for causing at least one cycle of the change in the voltage indicated by said voltmeter.

4,506,997

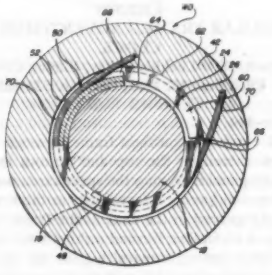
ROCK BIT CONE RETENTION

Michael E. Schramm, El Toro, and Edward Vezirian, Irvine, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Division of Ser. No. 371,360, Apr. 23, 1982, Pat. No. 4,444,518. This application Nov. 21, 1983, Ser. No. 553,595

Int. Cl.³ F16C *43/02;* **E21B** *10/22*

U.S. Cl. 384—96 **4 Claims**



1. A rotary rock bit comprising:

a main bit body having at least one leg extending therefrom, each leg having a journal bearing projecting substantially radially inwardly from said leg, said journal having a first base portion and a second end, said journal further forms a first annular groove in a bearing surface formed by said

journal bearing, said groove is transverse to an axis of said journal;

a cutter cone adapted to be rotatively mounted on said journal bearing, each cone forming an inwardly facing bearing surface adapted to register with said journal bearing surface, said cone further forms a second annular groove in said cone bearing surface transverse to the axis of the cone, said second annular groove in said cone registers with said first annular groove in said journal when said cone is properly positioned on said journal;

two or more substantially annular cone retention segments, said segments when positioned within one of said grooves allow said cone to pass over said second end of said journal; and

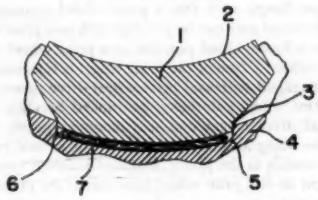
segment biasing means to bias each of said two or more segments into the other of said grooves when said first and second annular grooves register with one another thus retaining said rotatable cone on said journal said biasing means is a coil spring means adjacent said outside diametrical surface formed by each of said segments, said coil spring means is in tension to urge said segments into said first annular groove.

4,506,998

ELASTOMERICALLY SUPPORTED PIVOTED PAD BEARING

Merle R. Showalter, Madison, Wis., assignor to Automotive Engine Associates, Madison, Wis.

Filed Jun. 9, 1983, Ser. No. 502,577
Int. Cl.³ F16C *17/03*
U.S. Cl. 384—312 **2 Claims**



1. A pivoted pad slider bearing adapted to permit tilting of a metallic pad with respect to a surface sliding relatively to said pad so that said metallic pad pivots about a virtual pivot point so that a converging wedge oil film is established between said metallic pad surface and said relatively sliding surface and said metallic pad surface tilts until a moment balance of the oil film pressure forces is established about said virtual pivot point where said metallic pivoted pad engages a rigid support structure so that said metallic pad and said support structure fit together in the manner of two dies forming a fully enclosed cavity,

the junction between said metallic pivoting pad and said support structure having enough clearance to permit said metallic pad to tilt in any direction over the range of pivot angles relevant to a pivoted pad slider bearing, but where said clearances are tight enough so that said pad motion with respect to said rigid structure is constrained between narrow limits,

wherein said cavity is completely filled with a flexible and incompressible liquid containing elastomeric pad adapted to function within said cavity with respect to bearing loads from said pad so that it is free to change its shape with only low mechanical resistance but is invariant in volume,

whereby the locus of positions of said metallic pad with respect to said support which exactly conserves the total volume of said elastomeric pad are such that the metallic pad can be said to pivot about a geometrical virtual pivot point,

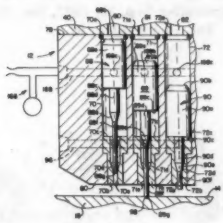
so that said liquid containing elastomeric pad structure supports compressive loads on said metallic pad sliding surface in an approximately hydrostatic manner and yet supports said metallic pad hydrostatically in such a way that said metallic pad is free to pivot about said geometrical virtual pivot point, and said pad is very strongly and stiffly supported with respect to bearing loads on said pivoted pad's bearing surface so that an extremely rugged pivoted pad slider bearing assembly is formed.

4,506,999

PROGRAM CONTROLLED PIN MATRIX EMBOSSING APPARATUS

John A. Robertson, Chillicothe, Ohio, assignor to Telesis Controls Corporation, Chillicothe, Ohio

Filed Jul. 12, 1983, Ser. No. 512,984
Int. Cl.³ B41J *3/10*
U.S. Cl. 400—121 **20 Claims**



1. Apparatus for marking solid material objects at a surface thereof with a predetermined character sequence, comprising:

a support structure situable in proximity to said material surface;

head means coupled with said support structure having a confronting surface positionable a predetermined distance from said material surface, an array of discrete chambers within said head means each being configured having a piston receiving portion extending from an abutting position toward a seating surface and communicating with a shaft receiving portion extending from said seating surface toward an opening at said confronting surface, marker pin means within each said chamber, each having a piston portion pneumatically, drivably movable between a first position adjacent said abutting position and said seating surface within said receiving portion and having a shaft portion depending from said piston portion extending to a character component forming surface and slidable within said shaft receiving portion;

drive conduit means in pneumatic communication with said chamber at a location adjacent said abutting surface for selectively driving a select said marker pin means piston defining portion with a drive force toward said seating surface to effect an impacting of said character component forming surface with said material surface;

first valve means actuable for selectively effecting the application and release of gas under select drive pressure to said drive conduit means;

return conduit means in communication with said pin chambers substantially adjacent said seating surface for continuously pneumatically biasing each said piston portion toward said abutting surface at a return force selected having a value less than said drive force for effecting the rapid return of said piston portion towards said first position when said first valve means is actuated to selectively release gas under drive pressure to said drive conduit means;

pressure relief means connected with said return conduit means for limiting sudden pressure build-up at said return conduit means to substantially continuously maintain said return pressure value at said return conduit means; and

control means for actuating said first valve means to effect the rapid drive of select said marker pin means piston portions pneumatically from said drive conduit means while simultaneously compressing gas provided from said return conduit means in the region of said chamber substantially situate intermediate said piston portion and said seating surface to derive a selected character formed by the said impacting of said character component forming surface of said marker pin means with said material surface.

4,507,000

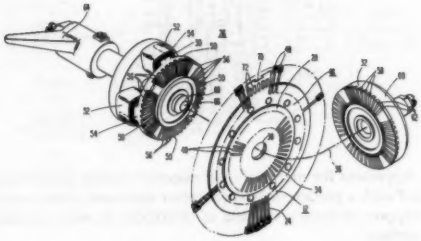
CHARACTER PRINT WHEEL WITH DRIVE ELEMENTS

Dan W. Matthias, Downingtown, Pa., and Richard D. Thornton, Concord, Mass., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 21,769, Mar. 19, 1979, abandoned, which is a continuation of Ser. No. 809,923, Jun. 24, 1977, abandoned. This application Sep. 23, 1983, Ser. No. 534,933

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **8 Claims**



1. A printing apparatus comprising:

a rotary character array including a plurality of character elements located at a plurality of circumferentially spaced print positions radially displaced with respect to the axis of rotation;

a drive apparatus for said character array comprising a rotary stepper motor including:

a stator having a plurality of circumferentially spaced stator elements comprising magnetic material, said stator comprising a first stator portion and a second stator portion axially displaced with respect to said first portion so as to form an axial air gap;

energizing means for selectively energizing said magnetic stator elements, and

a rotor including a hub portion carrying a plurality of circumferentially spaced rotor elements comprising magnetic material inserts in said hub portion radially displaced from said axis of rotation and juxtaposed to and spaced from said magnetic stator elements; said rotor elements adapted to close various flux paths between said stator elements in response to selective energization of said stator elements by said energizing means; and

a platen;

said character array being attached directly to said rotor for rotating said character array and said character array comprising a plurality of spokes extending and being spaced radially outwardly from said hub portion and said rotor elements so as to be juxtaposed to the platen, said character elements being located on said spokes, wherein the axial thickness of said character elements does not substantially exceed the axial thickness of said hub portion including said inserts, the apparatus further comprising support means for said hub portion, said support means being axially retractable so as to permit removal of said rotor and said character array from said axial air gap without altering the dimensions thereof.

4,507,001

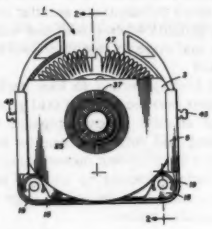
PRINT WHEEL MOUNTING

Egon S. Babler, Northbrook, Ill., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 141,442, Apr. 18, 1980, abandoned. This application Nov. 3, 1980, Ser. No. 202,977

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **3 Claims**



1. A mounting and drive apparatus for an impact printer print wheel which comprises:

(a) print wheel drive means for releasably engaging a print wheel, said drive means including a drive means flange;

(b) hammer means positioned such that, when activated, the hammer means will cause preselected type characters on the print wheel to move toward a platen;

(c) a print wheel gate pivotably mounted on said drive means flange such that a print wheel contained in said print wheel gate can be pivoted with said print wheel gate from a load/unload position to a print wheel drive position where a face of the print wheel is releasably, driveably engaged with said print wheel drive means,

said print wheel gate being positioned between said print wheel drive means and said hammer means, said drive means being located on the same side of said print wheel gate means as the platen, and said hammer means is connected to said print wheel gate means for pivotal motion therewith.

4,507,002

PRINTING TIMING CORRECTION DEVICE IN SHUTTLE TYPE DOT LINE PRINTER

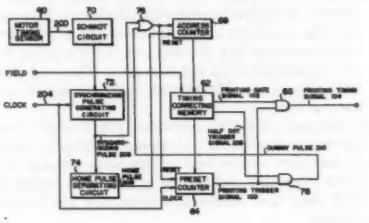
Hisayoshi Matsumoto, Tokorozawa, and Takahiko Fukuzawa, Hoya, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1983, Ser. No. 554,827

Claims priority, application Japan, Nov. 26, 1982, 57-207980

Int. Cl.³ B41J *19/30*

U.S. Cl. 400—322 **5 Claims**



1. A printing timing correction device in shuttle type dot line printer wherein a shuttle is reciprocated in directions perpendicularly intersecting a direction of feeding printing paper, printing needles regularly arranged on said shuttle are projected to recording paper to thereby conduct desirable printing

operations and said shuttle performs non-constant velocity motion for which the rotation of a driving motor is transmitted by a crank mechanism, characterized in that said printer comprises:

a motor timing sensor for electrically detecting the rotational phase of said driving motor;

a timing correcting memory for storing timing correcting values for correcting the non-equal interval phase of said shuttle against the rotational phase of said motor per printing timing;

an address counter for successively reading out the timing correcting values from the timing correcting memory; and

a delay timing correcting circuit for outputting printing timing signals corrected in accordance with the timing correcting values of said timing correcting memory to a printing needle driving device of said shuttle;

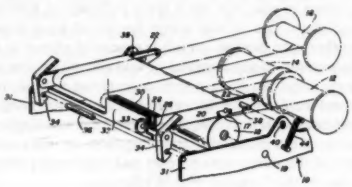
and said address counter is successively renewed by the equal interval pulses detected from said motor timing sensor, delay time periods of the delay timing correcting circuit are set in accordance with the timing correcting values stored in said timing correction memory per printing timing, and printing timing signals are outputted for control at equal interval positions on the printing paper in accordance with the non-constant velocity motion of said shuttle.

4,507,003

PAPER TAPE FEED AND DRIVE MECHANISM

Karl T. Wincent, Tiverton, R.I., assignor to Litton Systems, Inc., Fall River, Mass.

Filed May 26, 1983, Ser. No. 498,400
Int. Cl.³ B41J *13/02*
U.S. Cl. 400—636 **3 Claims**



1. A paper feed and drive mechanism for use in a high speed printer in which a matrix printing element is used to print alpha-numeric information through an inked ribbon onto a paper tape comprising:

a machine frame,

a drive roll mounted on said frame,

a pair of arms having first and second ends which may be selectively positioned in a first lowered position, or in a second raised position, and mounted adjacent said first ends to said frame by pivot posts,

a pressure roll mounted on said pair of arms near said first ends,

a platen having a printing surface mounted on said pair of arms near said second ends,

spring means attached to said first ends of said arms and to said machine frame,

clips mounted on said second ends of said arms for holding said arms in the first lowered position against the bias of said spring means,

a line of contact formed between the pressure roll and the drive roll when said arms are in said first lowered position, said line of contact forming a nip through which said paper tape is driven,

a narrow printing gap formed between said printing surface and said inked ribbon when said arms are in said lowered position,

release means on said clips for releasing said clips and thereby allowing said arms to raise to the second position in response to said spring bias, whereby a gap is formed between said drive roll and pressure roll

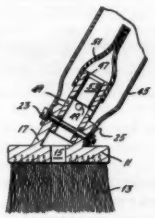
a wide non-printable gap formed between said printing surface and said inked ribbon when said arms are in said raised position, whereby said paper tape may be replenished without threading said tape through either said nip or said narrow printing gap.

4,507,004

SIDE HANDLE RESERVOIR BRUSH

Merritt L. Moffitt, Jr., 9 Weirwood Rd., Radnor, Pa. 19087

Filed Nov. 12, 1982, Ser. No. 440,864
Int. Cl.³ A46B *11/04*; A47L *13/22*
U.S. Cl. 401—275 **8 Claims**



1. A suction pump brush having a brush head with bristles on one side thereof, an elongate reservoir hollow handle capable of holding a fluid attached to another side of said brush head, a passageway passing through said brush head and connecting said hollow handle to said bristle side of said brush head, and a piston positioned within said hollow handle and operable to create a vacuum at said passageway, the improvement comprising:

mechanical means for operating said piston in reciprocating movement, said mechanical means being connected to said piston and extending outwardly through a longitudinal side of said hollow handle;

check valve means positioned to intercept the fluid passing through said passageway, said check valve means operating to open upon said piston created vacuum and closed otherwise thereby preventing fluid from reentering said passaeway therethrough;

at least one discharge port providing a by-pass around said check valve means.

4,507,005

PIVOT JOINT

Robert L. Siewert, Benton Harbor, and Edmund K. Varnelis, St. Joseph, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 21, 1983, Ser. No. 553,456
Int. Cl.³ F16C *11/00*
U.S. Cl. 403—16 **12 Claims**

1. A pivot joint mechanism for connecting a pair of relatively movbable members, one of said members being bifurcated and having two laterally spaced planar portions, the other of said members having a planar portion located between said spaced planar portions, each of said planar portions having a circular opening therein with the centers thereof aligned along an axis extending transversely to the planes of the planar portions, comprising

an annular bushing located in the opening in the other of said members,

a cylindrical pin having a central portion and two end portions and a longitudinal bore therethrough,

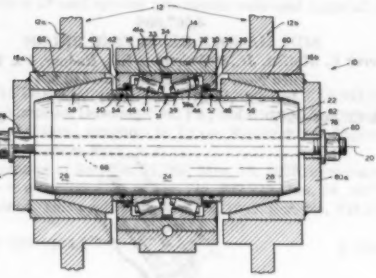
said central portion of said pin located within said bushing,

a pair of bearing seal retainers also located within said bushing and secured thereto,

an anti-friction bearing captured between said bearing seal retainers providing for pivotal movement of said other member relative to said pin,

a pair of spacer rings around said pin and abutting opposite ends of said bearing,

a pair of male locking members surrounding said two end portions of said pin and abutting said spacer rings respectively,



a pair of female locking members in contact with said male locking members respectively, and

means including a tension member extending through said longitudinal bore in the pin for urging said female locking members into a locking relationship with the respective male locking members.

4,507,006

QUICK-RELEASE MECHANICAL COUPLING FOR A KITCHEN APPLIANCE

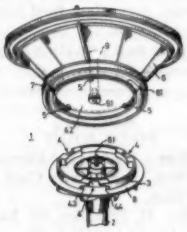
Jurgen Golob, Friedrichsdorf, and Alfred Gehrmann, Eschborn, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,436

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1981, 3141355

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—24 **7 Claims**



1. A quick release mechanical coupling for a kitchen appliance having a drive shaft, comprising:

an attachment for said kitchen appliance;

a first coupling ring rotationally integral with said attachment, and

a second coupling ring rotationally integral with said drive shaft;

wherein one of said first and second coupling rings is provided with at least one connecting pin and the other of said first and second coupling rings is provided with at least one recess having a central slot portion and first and second relatively extended branch portions with first and second converging edges extended in opposite circumferential directions from said central slot portion;

said pin being of generally rounded cross-section such that it may be wedged into either of said first or second branch portions by relative rotation of said first and second coupling rings thereby frictionally intercoupling said rings in both an axial and a rotational sense;

whereby said pin may be inserted in said central slot portion and, by relative rotation of said first and second coupling rings, will be frictionally clamped between said first and second converging edges of one of said first and second branch portions.

4,507,007

YOKE IN PARTICULAR FOR A UNIVERSAL JOINT

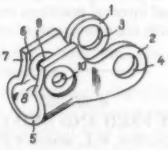
Bernard Mallet, Limay, France, assignor to Nadella, Rueil Malmaison, France

Filed Apr. 14, 1983, Ser. No. 484,928

Claims priority, application France, Apr. 15, 1982, 82 06469

Int. Cl.³ F16C *11/06*

U.S. Cl. 403—157 **10 Claims**



1. A coupling element, in particular a yoke for a universal joint, made from a rolled blank or a tube section, comprising in combination a split hub provided with clamping means formed by two wings of said hub, each wing defining an aperture, the outer surface of one of said wings having at least around the aperture thereof a portion which is rendered planar as a result of a compression of the material of said one wing, the other of said wings of the clamping means comprising around the aperture thereof a spigot in a thickened portion of the wing which thickened portion is the result of an upsetting and displacement of a portion of the material of the wing from an inner side to an outer side of the wing, which upset and displaced portion also contributes to the forming of said aperture.

4,507,008

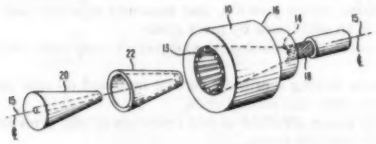
STRANDED CABLE TERMINATION ARRANGEMENT

Ali Adl, Freehold Township, Monmouth County, and William D. Backus, Bricktown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 13, 1983, Ser. No. 495,066

Int. Cl.³ F16G *11/05*

U.S. Cl. 403—275 **5 Claims**



1. A stranded cable termination arrangement comprising

a high strength socket having a frustum shaped interior tapering from a base opening to a top opening;

a group of high strength cable strands inserted into the top opening with individual strands spread out forming a single layer of strands at the base opening;

a malleable metallic sleeve shaped to fit inside of the socket; and

a high strength plug inserted into the sleeve and socket by a compressive force exceeding a maximum tensile force of

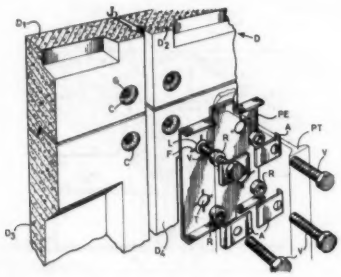
the stranded cable for reforming the sleeve around the strands and holding the cable in the socket without slippage when a tensile force is applied between the cable and the termination arrangement.

4,507,009

MEANS AND METHOD FOR PREVENTING CRACKS FROM DEVELOPING IN AN INDUSTRIALIZED HOUSE

Jean Tardif, Feuchérolles, France, assignor to Maisons Phénix, Paris, France

Filed Jan. 17, 1984, Ser. No. 571,666
Claims priority, application France, Jan. 20, 1983, 83 00826
Int. Cl.³ F16B 5/00
U.S. Cl. 403—306 **6 Claims**



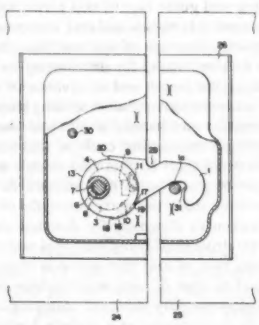
1. Means for counteracting the opening of joints formed by adjacent edges of facing slabs disposed and secured in front of a post of a carrier frame structure of an industrialized house, wherein a fish-plate is anchored to at least two slabs so as to bridge their common joint, said fish-plate and slabs being provided with complementary anchoring means preventing any independent movement of said slabs, said anchoring means being of the type in which a projection formed on one of the two elements is embedded without play into the other element.

4,507,010

PANEL FASTENER

Toshimichi Fujiya, No. 4-22, Kounandai 6-chome, Kounan-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Mar. 2, 1983, Ser. No. 471,222
Int. Cl.³ F16B 21/00
U.S. Cl. 403—322 **1 Claim**



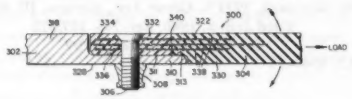
1. A panel fastener for connecting and fastening together dual mating panels, said fastener comprising: a first section secured to one panel and a second section secured to the other panel, said first section including a hook plate provided rotatably an eccentric cam provided in said first section, rotatably fitted in a cam receiving hole formed in a proximal end of said hook plate; a C-shaped leaf spring mounted in a free state in a spring-mounting recess formed in a part of an inner peripheral surface of said cam receiving hole and also in a relief recess formed in a part of an outer peripheral surface of said eccentric cam, a circular portion of said leaf spring slipping out of said relief recess when said eccentric cam is rotated by a rotational operation member inserted into a receiving hole formed in an eccentric shaft of said eccentric cam, and thereby said leaf spring causing a frictional force between said eccentric cam and said hook plate; said second section comprising a pin provided therein, whereby said hook plate is rotated together with said eccentric cam owing to said frictional force when said eccentric cam is rotated by said rotational operation member, and said eccentric cam is further rotated to tightly engage an end hook portion of said hook plate with said pin after said hook plate is engaged with said pin; wherein said eccentric cam is provided with a larger-diameter guide disc part on one side surface thereof which slidably contacts with one side surface of said proximal end of said hook plate, said eccentric cam further being provided with a locking projection on the other side surface thereof, a rotational angle-restricting disc having a diameter equal to those of said proximal end of said hook plate and said guide disc part of said eccentric cam, said rotational angle-restricting disc being provided with an eccentric shaft-receiving hole and a locking projection-receiving slot, whereby said eccentric shaft and said locking projection being fitted with said eccentric shaft-receiving hole and said locking projection-receiving slot, respectively, prevent said rotational angle-restricting disc from rotating relative to said eccentric cam, said leaf spring being clamped between said guide disc part of said eccentric cam and said rotational angle-restricting disc, said angle-restricting disc being further provided with a stopper projection on a portion of an outer peripheral surface thereof, and said hook plate being further provided with stopper walls on both ends of circumferential surface of said proximal end portion, said stopper walls being spaced from each other, whereby one of end surfaces of said stopper projection abuts against one of said stopper walls to prevent an erroneous reverse operation of said eccentric cam, and the other end surfaces of said stopper projection abuts against the other of said stopper walls to prevent an excessive rotational operation of said eccentric cam.

4,507,011

REINFORCED ELASTOMER ATTACHMENT JOINT

Stephen T. Brown, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 3, 1982, Ser. No. 374,268
Int. Cl.³ F16B 5/00
U.S. Cl. 403—404 **17 Claims**



1. A reinforced attachment joint, comprising:
a first section fabricated from a first material;
a second section, fabricated from a second material which is different from said first material comprising said first attachment joint section, substantially butt bonded to said first section so as to substantially define a boundary line between said first and second attachment joint sections; and
means embedded within said first and second attachment joint sections and extending for a substantial distance, in opposite directions across and beyond said boundary line, into each of said first and second attachment joint sections for connecting said first and second attachment joint sections together and for transmitting load forces from

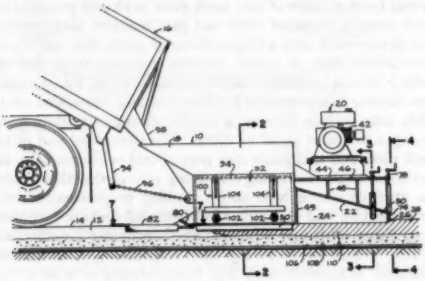
said first attachment joint section to said second attachment joint section.

4,507,012

APPARATUS AND METHOD FOR FILLING TRENCHES IN PAVED SURFACES

John J. Corcoran, 5329 Via Corona, Los Angeles, Calif. 90022, and John P. Fraijo, 16154 Calle De Paseo, Irwindale, Calif. 91706

Filed Apr. 9, 1982, Ser. No. 367,133
Int. Cl.³ E01C 19/12
U.S. Cl. 404—72 14 Claims



12. Apparatus for filling a trench in an existing paved surface with precompacted asphalt paving material, comprising:

a primary structure movable along the trench in contact with the paved surface, including:

means for receiving loose asphalt paving material; and

means for conducting the asphalt paving material from the receiving means to the trench as the primary structure moves;

the conducting means comprising a pair of side walls extending rearwardly along the paved surface and a rearwardly sloping upper surface portion spanning the two side walls to define an open bottomed flow chamber which terminates in a rear opening above the level of the paved surface, such that paving material is forced through the opening as the primary structure moves; and

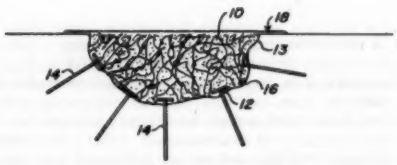
means for vibrating the primary structure as the paving material is conducted to the trench.

4,507,013

DEVICE AND METHOD FOR REPAIR OF POT HOLES

Bonifac Martinak, 2939 S. Grove Ave., Berwyn, Ill. 60402

Filed Jun. 6, 1980, Ser. No. 157,072
Int. Cl.³ E01C 7/00, 23/09
U.S. Cl. 404—75 8 Claims



5. A device useful in the patching of pot holes in streets and roads comprising:

a loose mass of randomly oriented flexible filaments; and

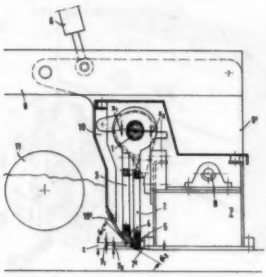
clamping means securing said filaments together over a minor portion of the length of each filament to provide a unit which can be firmly anchored in the bottom of a pot hole by anchor means driven through said clamping means into the bottom of the hole.

4,507,014

CONSOLIDATING PLANK FOR A HIGHWAY FINISHING MACHINE

Dirk Heims, Bad Munder; Hans-Gert Ottermann, and Robert Prang, both of Hameln, all of Fed. Rep. of Germany, assignors to ABG-Werke GmbH, Hameln, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,416
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1983, 3300092
Int. Cl.³ E01C 19/30
U.S. Cl. 404—102 3 Claims



1. A consolidating plank mechanism for a road finishing machine movable in a driving direction during operation, said plank including a basic plank body having a downwardly facing undersurface extending perpendicular to said driving directiion, a stamping unit in front of said plank body with respect to said driving direction of said machine, said stamping unit having at least two cooperating stamps slidably engageable with one another and extending perpendicular to said driving direction along the length of said plank body, said two stamps consisting of a rear stamp located immediately in front of said plank body and a forward stamp located immediately in front of said rear stamp, each of said two stamps having a lower end portion with a generally downwardly directed stamping face, means providing a forwardly directed vertical guide face on the forward side of said plank body, said rear stamp having a lower end portion with a rear vertical face slidably engaging said guide face of said plank body so that no substantial space exists between said rear stamp and said plank body in said driving direction of said machine, means located in front of said forward stamp for distributing loose construction material along the length and in advance of said forward stamp, a single eccentric drive shaft extending perpendicular to said driving direction and located above said stamping faces, and means drivingly connecting each of said stamps to said single eccentric drive shaft so that said stamps are vertically reciprocated out of phase with one another in response to rotation of said drive shaft, the vertical lengths of each of said two stamps between its downwardly directed stamping face and said eccentric drive shaft being such that said downwardly directed stamping face of said rear stamp is reciprocated at a level about equal to that of said undersurface of said plank body and said downwardly directed stamping face of said forward stamp is reciprocated at a slightly higher level than that of said rear stamp so that in the operation of said finishing machine as it moves forwardly in said driving direction said forward stamp first precompacts said construction material immediately following which said construction material is further compacted by said rear stamp and is then immediately run over by said undersurface of said plank body.

4,507,015

ARRANGEMENT FOR PAVING ELASTIC SURFACE MATERIAL

Genzo Furukawa; Yutaka Sugie, and Masami Fujii, all of Kobe, Japan, assignors to Sumitomo Gomu Kogyo Kabushiki Kaisha, Kobe, Japan

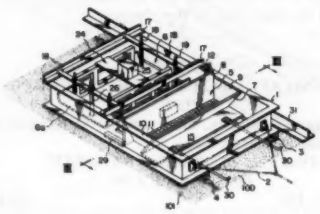
PCT No. PCT/JP82/00072, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03234, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 16, 1982, Ser. No. 438,880

Claims priority, application Japan, Mar. 16, 1981, 56-38247; Nov. 9, 1981, 56-179185

Int. Cl.³ E01C *19/48*

U.S. Cl. 404—103 13 Claims



1. A paving arrangement for coating a base with a molding material comprising:

a rigid frame in the form of a shallow box having an open bottom;

a first longer sleigh member and a second shorter sleigh member of an equal height mounted on the lower portion of the frame in spaced relationship from each other for sliding over the base as the frame is pulled by a traction unit during use of the paving arrangement, the shorter sleigh member having its rear end terminating forwardly of the rear end of the longer sleigh member;

a hopper located at an intermediate position within the frame, the hopper having a front wall, a rear wall and a pair of sidewalls and having a transversely elongate outlet opening in its bottom, the outlet opening being positioned rearwardly of the rear end of the shorter sleigh member and extending in the transverse direction between the inner edge of the longer sleigh member and an imaginary extension of the outer edge of the shorter sleigh member, the molding material being received and stored in the hopper so as to be poured onto the base through the outlet opening;

a screed assembly located within the frame at a location rearwardly of the hopper for compacting the molding material to a given height as it is poured onto the base through the outlet opening of the hopper;

and an auxiliary sleigh member supported by the frame at a location rearwardly of the shorter sleigh member, the auxiliary sleigh member being located between the hopper and the rear end of the screed assembly and having means for maintaining the frame in its horizontal position.

4,507,016

MARINE RAIL SYSTEM

John H. Honour, VII, 3560 Ivy Pl., Wayzata, Minn. 55391

Filed Jul. 26, 1982, Ser. No. 402,089

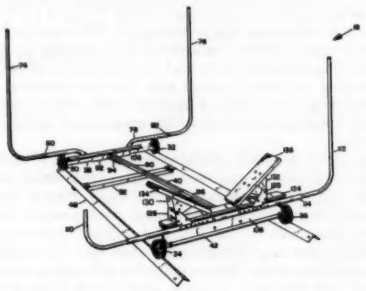
Int. Cl.³ B63C *3/08, 5/05, 13/00;* B60P *3/10*

U.S. Cl. 405—2 7 Claims

1. Marine rail system comprising:

a. rail means including a plurality of splicable rail sections each rail section having a ramped cross section, cross ties securing each set of rails, splicer plates splicing said rail sections together with nut-and-bolt assemblies, and a winch section for supporting a winch including a steel cable, stabilizer ties supporting said winch section and rail section on land; and,

b. carriage means including a forward carriage and a rearward carriage, and torque tube means interconnecting between adjustable center portions of said forward carriage and said rearward carriage and including a forward torque tube of rectangular cross section mount affixed to said forward carriage and a rearward torque tube of rectangular cross section mount affixed to said rearward carriage and a torque tube of rectangular cross section therebetween, each of said torque tubes, said forward and said rearward torque tube mounts including a plurality of holes for adjustability and securing by hitch pins, strap means secured between said winch cable and said torque bar means, telescoping adjustable guide bar means secured to said forward carriage and to said rearward carriage, each of said guide bar means including a geometrically configured lower section, substantially vertical upright guide bars telescoping and engaging within opposing ends of said geometrically configured lower section, each of said telescoping ends including a plurality of holes, nut-and-bolt assemblies secured through one of said plurality of holes for securing said upright guide bars to said lower section, said forward carriage including a planar bunk member thereacross, bracket means positioned on an upper portion of said rearward carriage and slidably ad-



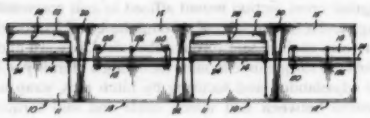
justable for adjustment along a horizontal length of said rearward carriage, said bracket means including two opposing lower rear bunk brackets, two opposing upper rear bunk brackets pivoted to said lower rear bunk brackets respectively by a bolt means, lower and upper lips of said lower rear bunk brackets engaging about a horizontal portion of an I-beam of said rearward carriage, and wooden bunk pads secured to each of said upper bunk brackets by bolt means, and wheel means including V-grooved wheels with bearings secured to an axle, said axle secured to each of said forward and rearward carriages, said V-grooves engaging with ramped edge of said rail system whereby said carriage is pulled into a water position from a land position by gravity through said winch cable and pulled from a water position to a land position against gravity by said winch cable, said carriages adjustable in length by said torque tube means and in width for accepting a watercraft by said guide bar means, and in bunk means by said adjustable bunk bracket means for accepting a V-hull or like vessel, and said torque tube is flexible for accommodating differences in said rail height or gull differences, providing for flexing about said torque tube means, thereby providing a carriage which is pivotable about the horizontal as well as the vertical axis during hauling of the watercraft which rests on said carriages and above said torque tube.

4,507,017

SEGMENTED, FLOATING FIREPROOF OIL-SPILL CONTAINMENT BOOM

Richard E. Magoon, 8545 27th St. West, Tacoma, Wash. 98466

Filed Sep. 7, 1982, Ser. No. 415,406
Int. Cl.³ E02B *15/04*
U.S. Cl. 405—66 **20 Claims**



1. A foldable, floatable fireproof spill-containment boom easily deployable on the surface of a body of water comprising:

a series of fireproof planar main panels, said main panels having flotation devices attached thereto, said main panels being of a first type and a second type, the panels of said first type having flotation-mounting arms associated therewith, said flotation devices being mounted on respective ends of said flotation-mounting arms in outrigger fashion on each side of said main panel and said main panels of said second type having said flotation devices attached directly to said main panel;

said flotation devices including a shell constructed and arranged to contain a flotation material, said flotation material comprising a closed-cell glass foam of a density of approximately 8.5 pounds per cubic foot and a fire-resistance temperature of approximately 900 degrees F., said shell being further constructed and arranged to enclose said flotation material in such a manner as to promote the wicking of water around said flotation material while enclosing steam formed by said water when contacting said flotation material in a high-temperature environment; and

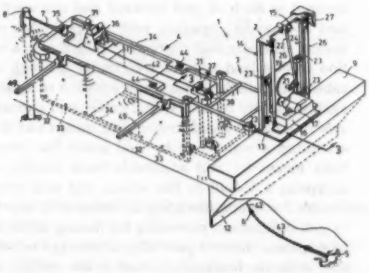
hinge means hingedly attaching adjacent ones of said main panels of said first and second types in alternating fashion, said hinge means including semi-rigid hinged coupling panels of right-angle, trapezoidal configuration, each of said trapezoids having first and second opposing edges, said second edge being longer than said first edge, said trapezoidal panels being arranged in alternating manner so that said first edge is above said second edge in a first coupling panel and said first edge is below said second edge in a second adjacent coupling panel.

4,507,018

WAVE MAKING MACHINES

Per F. Andersen, 501-3755 Bartlett Ct., Burnaby, B.C., Canada V3J 7G7

Filed Jun. 24, 1982, Ser. No. 392,452
Int. Cl.³ E02B *3/00*
U.S. Cl. 405—79 **7 Claims**



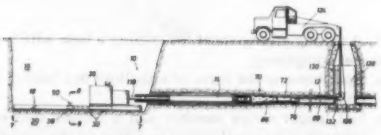
1. In a wave making machine which is adapted to support a wave making plunger at the surface of a body of water for periodic motion between a raised position and a lowered position to generate waves, the improvement wherein said plunger has a wedge shaped upper portion and a thin fin which extends downwardly from the wedge shaped portion, said plunger having a front face and a back face which are oppositely disposed, said front face having a first portion which is downwardly and rearwardly inclined and forms the front face of the wedge shaped portion and a second portion which extends parallel to the back face and forms the front face of the fin, said back face being substantially planner and extending normal to the surface of the water said thin fin serving to space the lower edge of the plunger from the lower end of the inclined first portion of the front face whereby upon periodic motion waves are generated at the front face and substantially no waves are generated at the back face of the plunger.

4,507,019

METHOD AND APPARATUS FOR REPLACING BURIED PIPE

Alan E. Thompson, Kilgore, Tex., assignor to Expand-A-Line, Incorporated, Pasadena, Tex.

Filed Feb. 22, 1983, Ser. No. 468,137
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—154 **19 Claims**



1. A method of replacing buried nonmetal tile pipe with replacement pipe having an internal diameter that may exceed the internal diameter of the existing buried tile pipe comprising:

(a) locating pipe fracturing and replacement apparatus in axial registry with the centerline of the pipe to be replaced, said pipe fracturing and replacement apparatus having a pipe fracturing mandrel of generally frusto-conical configuration and having a diameter at its leading extremity not greater than the internal diameter of said buried nonmetal tile pipe and a diameter at its trailing extremity which is greater than the outer diameter of said replacement pipe;

(b) simultaneously forcing said pipe fracturing mandrel through said buried tile pipe, reducing the pipe to be replaced to a fractured form having a multitude of pipe fragments of irregular form and

forcing each of the pipe fragments of the fractured tile pipe radially outwardly into the surrounding earth formation thus forming a replacement pipe passage of a dimension exceeding the external dimension of the replacement pipe; and

(c) extending a replacement pipe into the passage simultaneously with passage of said pipe fracturing mandrel through said buried nonmetal tile pipe.

4,507,020

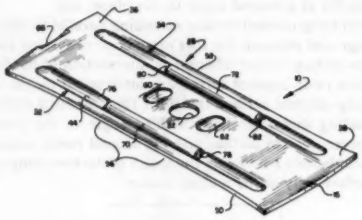
MINE ROOF BEARING PLATE

Louie Zeitler, Brecksville, and David C. Liber, North Royalton, both of Ohio, assignors to Die-Matic Corporation, Brooklyn Heights, Ohio

Filed May 10, 1983, Ser. No. 493,373
Int. Cl.³ E21D *21/00*
U.S. Cl. 405—259 **1 Claim**

1. A bearing plate for use in supporting a mine roof, said bearing plate comprising an elongated sheet metal body section having a first side adapted to face toward the mine roof and a second side adapted to face away from the mine roof, said body

section having a pair of longitudinally extending edge portions, a central portion disposed between said edge portions, and a pair of elongated ribs extending across the central portion of said body section and generally parallel to said edge portions, each of said ribs defining an elongated groove in said first side of said body section, said body section including surface means for defining an opening formed in the central portion of said body section between said ribs to enable a mine roof bolt to extend through said bearing plate, a pair of reinforcing members disposed in said grooves on opposite sides of said opening



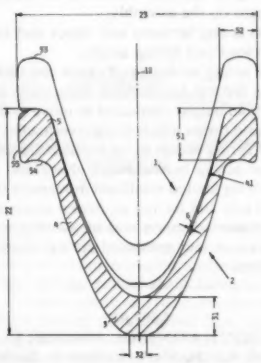
and extending across the central portion of said body section, and means for fixedly connecting each of said reinforcing members to said body section of said bearing plate to increase the resistance of said bearing plate to deflection under the influence of loads applied to said bearing plate, each of said reinforcing members having a first end portion which is disposed on one side of the central portion of said body section, a second end portion which is disposed on a second side of the central portion of said body section, and a midportion which spans the central portion of said body section.

4,507,021

PROFILE ELEMENT FOR MINING APPLICATIONS

Heinz Hofmann, Dortmund; Wilhelm Striepeke, Bochum; Manfred Werner, Lippstadt-Bad Liesborn; Herbert Kleinherne, and Christoph Zillessen, both of Recklinghausen, all of Fed. Rep. of Germany, assignors to Estel Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Continuation of Ser. No. 239,115, Feb. 27, 1983, abandoned.
This application Jun. 16, 1983, Ser. No. 500,939
Int. Cl.³ E21D *11/18*
U.S. Cl. 405—288 **9 Claims**



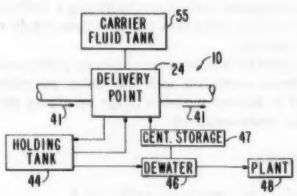
1. An elongated profile element of arcuate cross-section, particularly, for supporting minor excavations, including a member having a reinforced curved bottom wall and arcuate sidewalls provided with free edges and flanges which project outwardly thereof, a mean thickness of said flanges being equal to between 0.9–1.1 times the thickness of said bottom wall, a height of said flanges being equal to between 1.25–1.50 said bottom wall thickness, wherein the improvement comprises a minimum sidewall thickness which is equal to 0.30–0.35 times said bottom wall thickness, said bottom wall having a surface facing outwardly of said element and provided with a flat having transversely of the elongation a width which is at most equal to said bottom wall thickness, and said element having in direction transverse to said elongation a width which is equal to between 0.9 and 1.2 of the overall height of the element; said element deforming plastically and substantially uniformly throughout the regions of the element when subject to stress, so that substantially all regions will upon bending undergo uniform flowing to uniformly support weight when plastic deformation begins.

4,507,022

METHOD AND APPARATUS FOR TRANSPORTING SLURRY ALONG A PIPELINE

John C. Carney, San Francisco, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Apr. 20, 1982, Ser. No. 370,220
Int. Cl.³ B65G *53/30*
U.S. Cl. 406—50 **24 Claims**

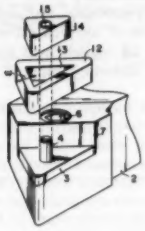


19. Apparatus for transporting a slurry comprising: a pipeline having an entry point and a number of downstream delivery points; means at the entry point for directing a batch of slurry having a cap and tail into the pipeline with the cap and tail being formed from a fluid suspension of fines; a holding tank, and a dewatering unit and a centrate storage unit at each downstream delivery point, respectively; first means directly connecting the holding tank at each downstream delivery point to the pipeline to permit a slurry batch and its cap and tail to be directed from the pipeline into the holding tank to form a mixture in the holding tank; second means connecting each dewatering unit directly to a respective holding tank to permit a part of the mixture of the holding tank to be received by the dewatering unit and to be dewatered to form a solids cake and a centrate defined as a fluid suspension of fines; third means connecting said dewatering unit at the corresponding delivery point directly to the centrate storage unit, whereby the centrate can be transferred from the dewatering unit to the centrate storage unit; fourth means for connecting said holding tank directly to the pipeline at the corresponding delivery point to permit a slurry batch in the holding tank to be returned to the pipeline; and fifth means connecting the centrate storage unit directly with the pipeline at the corresponding delivery point, whereby a cap and a tail from said centrate storage unit can be directed into the pipeline ahead of and behind a slurry batch returned to the pipeline from the respective holding tank for transit to the next downstream delivery point.

4,507,023
CUTTING TOOL

Hiroshi Shikata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 14, 1982, Ser. No. 368,438
Claims priority, application Japan, May 30, 1981, 56-83482; Aug. 26, 1981, 56-125197[U]
Int. Cl.³ B26D 1/00
U.S. Cl. 407—103 18 Claims



1. A cutting tool for operating on a rotating workpiece, said cutting tool during use being fed relative to said workpiece in a direction of an axis of rotation of said workpiece by a prescribed feed amount f per revolution of said workpiece, said cutting tool comprising:

a bit holder; and

a throw-away tip which is formed of superhard metal, which has an outer peripheral surface of prescribed shape, an inner peripheral surface provided concentrically with the outer peripheral surface and defining a hollow part and a predetermined thickness t which detachably mounted to the bit holder,

wherein a distance w between the inner peripheral surface of said throw-away tip and the outer peripheral surface thereof is defined within a range satisfying the following formula represented by:

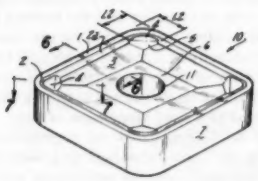
$$f_{max} \leq w \leq t,$$

where f_{max} is a maximum value for f.

4,507,024
CUTTING INSERT WITH CHIP CONTROL

Daniel R. Stashko, Holly, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation of Ser. No. 431,996, Sep. 30, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,533
Int. Cl.³ B26D 1/00
U.S. Cl. 407—114 14 Claims



1. In a tool for cutting chip forming materials having a cutting corner defined by the intersection of a chipbreaker surface and two flank surfaces and a cutting edge extending from the cutting corner along a boundary of one of the flank surfaces, the improvement comprising:

a land surface extending inwardly from the cutting corner and the cutting edge;

a first ramp control surface extending continuously along the cutting edge and the cutting corner from an inner boundary of the land surface downwardly at a first angle to the plane of the chipbreaker surface;

a corner control surface lying adjacent the first ramp control surface only in the cutting corner and extending inwardly from an intersection with the first ramp control surface so as to partially interrupt the first ramp control surface only in the cutting corner;

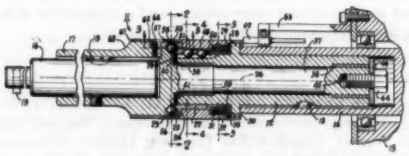
a second ramp control surface lying adjacent the corner control surface only in the cutting corner extending from an intersection with the corner control surface downwardly at a second angle to the plane; and

a third ramp control surface extending parallel to the cutting edge and adjacent the first ramp control surface except in the cutting corner wherein an intersection of the first and third ramp control surfaces is interrupted by the second ramp control surface the third ramp control surface extending downwardly at a third angle to the plane, the corner control surface and the second ramp control surface thereby narrowing the width of the first ramp control surface only at the cutting corner.

4,507,025
COMBINED TORQUE AND THRUST OVERLOAD RESPONSIVE TOOL HOLDER

John W. Fedor, Pepper Pike, Ohio, assignor to Masco Machine Incorporated, Highland Hts., Ohio

Filed Jun. 7, 1983, Ser. No. 501,874
Int. Cl.³ B23B 49/00
U.S. Cl. 408—6 20 Claims



1. A combined torque and thrust overload responsive tool holder assembly comprising, in combination:

a support;

a chuck adapted to hold a tool to cut a workpiece and having an axis;

a movable signal member including rotatable concentric sleeve means on the assembly;

spring means acting between said chuck and said support;

means to preload said spring means;

thrust means acting between said chuck and said support and permitting limited longitudinal movement therebetween and having an output connected to move said signal member upon said thrust means being overloaded to cause said preloaded spring means to be additionally stressed; and

torque means acting between said chuck and said support and permitting limited rotational movement therebetween about said axis and having an output connected to move said signal member upon said torque means being overloaded to cause said preloaded spring means to be additionally stressed.

4,507,026
DEPTH CONTROL ASSEMBLY

Wesley C. Lund, Seattle, Wash., assignor to Boeing Aerospace Company, Seattle, Wash.

Filed Sep. 29, 1982, Ser. No. 428,021
Int. Cl.³ B23B 45/14
U.S. Cl. 408—72 B 10 Claims

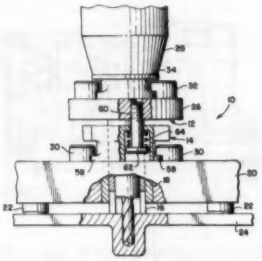
1. A depth control assembly for attachment at one end to a machine tool and at the other end to a drill plate of a jig having

selected guide holes positioned over points to be machined in a production part, the depth control assembly comprising:

a bushing member including at its one end a bushing sleeve for insertion into a guide hole of the drill plate and for engagement with the production part and further including at its opposite end a bushing plate for engagement with the machine tool,

a locking member slidably fitted over said bushing sleeve, said locking member including at least one aperture located opposite said bushing plate;

an elongated pin with a head larger than said aperture, said



pin being slidably received by said aperture and being fixed to said bushing plate,

means for temporarily fixing said locking member to the drill plate, and

resilient means for pressing said bushing sleeve into engagement with the production part when the locking member is fixed to the drill plate,

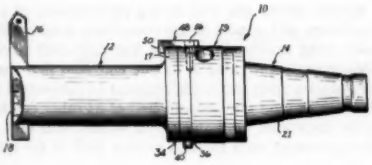
whereby a machine tool attached to the drill plate of the jig through the depth control assembly is spaced a constant distance from the production part, regardless of differences in distance between the face of the drill plate and the production part.

4,507,027

ADJUSTABLE BORING HEAD TOOL HOLDER

Thomas Adamson, 5512 Colonial La., South Bend, Ind. 46614, and Armand J. Schmaltz, 51233 Hollyhock Rd., South Bend, Ind. 46637

Filed Jul. 12, 1982, Ser. No. 397,129
Int. Cl.³ B23B 51/00
U.S. Cl. 408—197 **4 Claims**



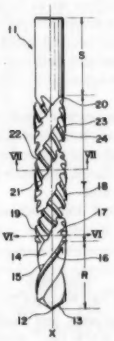
1. An adjustable boring head tool holder which includes a boring bar adapted to carry a cutting tool at one end, a bar holder, said bar holder having a housing and a shank extending from said housing, said bar holder shank being adapted to fit into the spindle of a boring mill, said bar holder housing having a longitudinal bore formed therein offset from the rotational axis of the housing, said bar including an extending shank at its opposite end, said bar shank being offset from the axis of the remainder of said bar, said bar shank fitted within said bar longitudinal bore, said bar and said bar holder having an identical rotative axis in a first position and having radially offset axes in a second position where the bar is rotated about said bar shank relative to the bar holder, the improvement wherein said bar has a slot formed therein and said bar holder housing has a slot formed therein, said bar slot and said bar holder slot being generally continguous and aligned when said bar and said bar holder are in their said first position, a removable key fitted into said aligned slots, said bar holder housing having a transverse bore intersecting one side of said bar holder longitudinal bore, a clamp slidably positioned within said bar holder transverse bore, means exteriorally accessible and in engagement with said clamp for shifting the clamp within said bar holder transverse bore into contact with said bar shank for securing said bar against rotation within said bar holder longitudinal bore, said key serving in conjunction with said clamp to secure said bar against rotation relative to said bar holder when said bar and bar holder are in their said first position, said key being removed from said bar and bar holder slots when said bar and bar holder are in their said second position.

4,507,028

COMBINED DRILL AND REAMER

Masahiro Matsushita, Daito, Japan, assignor to Densaburo Sakai, Osaka, Japan

Filed Sep. 23, 1982, Ser. No. 422,439
Claims priority, application Japan, Sep. 26, 1981, 56-152422
Int. Cl.³ B23B 51/08
U.S. Cl. 408—230 **8 Claims**



1. A combined drill and reamer tool, comprising:

a cylindrical body having a longitudinally extending axis of rotation, said body including a twist drill part for drilling, and a spiral reamer part for finishing, a hole in a workpiece having a thickness less than the respective longitudinal lengths of said twist drill part and said spiral reamer part, and a shank part for being held by the chuck of a rotary drill, said twist drill part being formed at one longitudinal end of said body, said shank part being formed at the other longitudinal end of said body, and said spiral reamer part being formed between said shank part and said twist drill part;

said twist drill part having;

a free tip end having a straight chisel edge and first and second radial drill cutting edges extending generally radially from opposite ends of said chisel edge to the radial periphery of said free tip end,

an other end of said twist drill part, opposite said free tip end, and

first and second twist drill cutting edges, respectively extending helically in a first circumferential direction at a same first helix angle with respect to said axis, from said first and second drill cutting edges at the radial periphery of said free tip end to said other end of said twist drill part;

said twist drill part and said spiral reamer part having

first and second twist drill flutes for passing therethrough chips of a workpiece cut away by said combined drill and reamer tool upon rotative application of said tool

by the drill to the workpiece, respectively extending spaced from, parallel to and along the full extent of said first and second twist drill cutting edges, and a first drill twist land between said first twist drill cutting edge and said first twist drill flute and a second twist drill land between said second twist drill cutting edge and said second twist drill flute, said first twist drill flute and said first land, and said second twist drill flute and said second land, respectively continuing longitudinally beyond said first and second twist drill cutting edges at said first helix angle through said spiral reamer part;

said spiral reamer part having;

a front neck of short longitudinal length adjacent said other end of said twist drill part,

a plurality of spiral reamer cutting edges, each spiraling on and extending completely across said first and second drill twist lands from said front neck to said shaft part around said axis in a circumferential direction opposite said first circumferential direction at a second helix angle with respect to said axis in the range 40° to 65°,

a chamfer of short longitudinal length adjacent said front neck, for facilitating said plurality of spiral reamer cutting edges biting into the workpiece,

a plurality of spiral reamer flutes formed in said first and second drill twist lands spaced from and extending parallel to respective ones of said plurality of spiral reamer cutting edges so as to spiral about said axis at said second helix angle for providing passages opening into said first and second twist drill flutes for passing therethrough into said first and second twist drill flutes chips of the workpiece cut away by said plurality of spiral reamer

a plurality of spiral reamer lands bridging the respective spaces between each of said plurality of spiral reamer cutting edges and said respective ones of said plurality of spiral reamer flutes, on each of said first and second twist drill lands, and

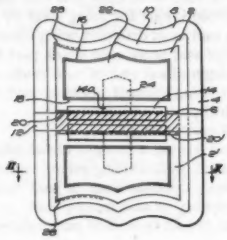
a rear neck of short longitudinal length adjacent said shank part.

4,507,029

METHOD OF MANUFACTURE OF JIGS

John A. Rose, Knaresborough, and Keith Dyer, Leeds, both of England, assignors to AMF Inc., White Plains, N.Y.

Division of Ser. No. 187,291, Sep. 15, 1980, Pat. No. 4,379,666.
This application Sep. 16, 1982, Ser. No. 418,871
Claims priority, application United Kingdom, Sep. 19, 1979, 7932472
Int. Cl.³ B23C *1/16*
U.S. Cl. 409—114 **6 Claims**



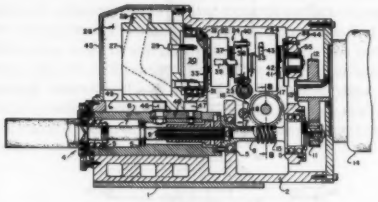
1. A method of use in the manufacture of profile sewing jigs comprising: mounting a top plate means in a predetermined spatial relationship with a sheet of bottom plate material, forming said top plate means from a sheet of top plate material so that at least a portion of the periphery is shaped according to the desired sewing profile, following said portion of the periphery of said top plate means by feeler means operatively connected to a forming means, forming in said sheet of bottom plate material contours including a slot and the outer peripheral edge of the bottom plate, attaching said top plate means relative to said bottom plate material such that said slot and said peripheral edge form the sewing profile of the jig.

4,507,030

CAM OPERATED MACHINING UNIT

Richard S. Jackson, Crestwood, Mo., assignor to Bourn & Koch Machine Tool Company, Rockford, Ill.

Filed Jul. 26, 1982, Ser. No. 402,157
Int. Cl.³ B23C *1/027*; B23B *47/18*
U.S. Cl. 409—185 **34 Claims**



1. A cam operated machining unit for use in the automated processing of other components, comprising, a base member, a spindle means capable of holding a tool movably supported upon said base member, said spindle means disposed for rotation, a motor means operatively associated with said unit and functioning to rotate said spindle means during its operation, quill means shiftable linealy and mounted to said base member and having the spindle means supported therein for rotation, said quill means arranged for lineal movement during unit operation, gear means formed upon said spindle means, cam means operatively associated with said quill means, intermediate gear means provided upon said base member and interconnecting the first named gear means to the cam means, for effecting the controlled actuation of said cam means, said cam means comprising a cam and mating follower combination, said cam means actuated into rotation through the operation of the intermediate and spindle gear means, said follower operatively mounted upon the quill means, whereby upon actuation of the said cam means the quill means shifts lineally under cam regulated conditions towards and away from the component being processed, said cam comprising a cylinder cam and having a predetermined rib means formed upon its periphery for precisely controlling the rapid approach and retraction in addition to the deliberate feed of the quill means and its supported spindle means and tool during performance of a machine operation, said spindle means comprising a pair of shafts, said shafts being axially aligned, the first said shaft having a tool holding means provided at its one end, said first shaft at approximately its other end being retained to the second shaft at one of its ends, and said second shaft at its other end being operatively associated with the motor means, and said gear means being formed upon the said second shaft of the spindle means.

4,507,031

POWER CHUCK FOR TURNING MACHINES

Karl Hjestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1982, Ser. No. 395,718
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127527
Int. Cl.³ B23B *31/14*
U.S. Cl. 409—234 **14 Claims**

1. A power chuck for a turning machine comprising:

a chuck body having an axis of rotation;

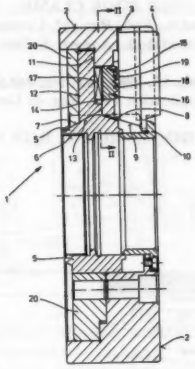
at least one clamping jaw radially movably mounted to said body;

a wedge bar movably mounted to said chuck body for tangential motion and engaged with said clamping jaw to move said clamping jaw radially inwardly and radially outwardly with movement of said wedge bar;

a push bar radially movably mounted to said body, and engaged with said wedge bar so that movement of said push bar in one radial direction moves said clamping jaw in an opposite radial direction;

a control member movably mounted to said body;

and



engagement means connected between said control member and saidl push bar for causing radial movement of said push bar in a first radial direction with movement of said control member so as to move said clamping jaw in an opposite second radial direction;

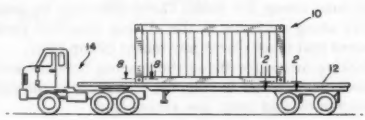
whereby with rotation of said chuck body, centrifugal force acts radially on said push bar in an outward radial direction which applies an inward radial force to said clamping jaw.

4,507,032

RETRACTABLE TWISTLOCK FOR SECUREMENT OF A CONTAINER TO A SUPPORT

Albert H. Rosaia, Long Island City, N.Y., assignor to Peck & Hale, Inc., Long Island City, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,528
Int. Cl.³ B65J *1/22*
U.S. Cl. 410—83 **26 Claims**



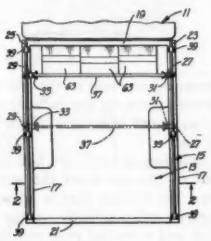
1. A twistlock for mounting and securing a container to a support including a socket mounted within an opening of said support in a position that an entry to a cavity in said socket locates at an upper surface of said support, and a plurality of operative components adapted for longitudinal movement to an elevated position from a retracted position within said cavity, said plurality of operative components including at least a first member, a second member, a rod supporting said first member in fixed relation at one end, and means carried by said rod for supporting said second member in a stacked position juxtaposed to said first member, a handle mounted at the other end of said rod exteriorly of said socket adapted for manipulating said operative components longitudinally relative to said socket, beyond said entry, to said elevated position and, then, for rotating said rod in one direction from a first to a second position to locate said first and second members angularly relative to their position within said socket for receipt thereover of a fitting at a corner of said container whereby said first member enters through an opening into the interior of said fitting, and finally in an opposite direction to return said rod to said first position, said operative components further including a lug extending radially from said rod in position for coupling said second member and rod, a recess formed in a surface of said second member into which said lug extends whereby said second member follows directly the rotation of said rod in one direction, only, and means for limiting rotation of said rod in said one direction to less than a full rotation.

4,507,033

LOAD SECURING APPARATUS FOR A CARGO CARRYING VEHICLE

Walter K. Boyd, 3100 Maricopa, Riverside, Calif. 92507

Filed Feb. 26, 1982, Ser. No. 352,799
Int. Cl.³ B60P *7/14*
U.S. Cl. 410—104 **13 Claims**



1. An apparatus for use with a vehicle having an open-topped cargo-carrying compartment with first and second side walls having upper ends, said apparatus comprising:

first and second elongated side rails;

means for attaching said side rails to the first and second side walls, respectively, adjacent the upper ends thereof with the side rails extending along their associated side wall and said rails and said side walls being physically separate members;

first and second connectors mountable on the first and second side rails, respectively, for movement along the associated side rail whereby the position of each of the connectors along its associated side rail can be adjusted;

said connectors including means engaging the side rails for releasably locking said connectors in any of a plurality of positions along their associated side rails;

first and second retainers coupled to the first and second connectors, respectively, for movement therewith and adapted to extend into the cargo-carrying compartment;

each of said retainers including means for retaining one side of a divider within the cargo-carrying compartment; and

said locking means being the sole means for releasably locking the first connector and the first retainer on said first side rail whether or not the divider is retained by the first retainer.

4,507,034

EXPANDABLE BUSHING AND LOCK FASTENER

Wing G. Lew, Los Angeles; Richard A. Deutsch, Tarzana, and Mojtaba Nasserian, Northridge, all of Calif., assignors to Adjustable Bushing Corporation, North Hollywood, Calif.

Filed Oct. 1, 1982, Ser. No. 432,266
Int. Cl.³ F16B *39/04*
U.S. Cl. 411—21 **10 Claims**

1. An improved fastener for use in securing workpieces

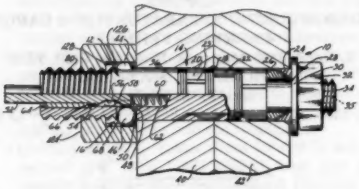
together, the workpieces having alignable holes for receiving the fastener and an outer surface adjacent one of the holes, the fastener comprising:

(a) a pin for insertion into the holes in the workpieces;

(b) at least one radially expandable, split ring bushing on the pin, the bushing having an inner tapered surface facing the axis of the pin;

(c) at least one radially contractable, split ring bushing on the pin, the radially contractable bushing having a tapered outer surface facing away from the axis of the pin, such surface being contiguous with the tapered surface of the radially expandable bushing;

(d) means on the pin to maintain the radially contractable split ring bushing at a predetermined axial position on the pin;



(e) actuator means on one end of the pin for producing an axial compressive force on the radially contractable split ring and a consequent expansion of the radially expandable bushing; and

(f) a ball lock including at least one ball located proximate the other end of the pin from the actuator means for bearing against the surface that is adjacent the holes, a slide displaceable independently of the actuator means between a first and a second position, the slide having a recess for receiving the ball in a radially withdrawn position in the first position of the slide and a land for maintaining the ball in a radially extended position in the second position of the slide, and biasing means for maintaining the slide in position to maintain the ball extended, the slide being movable against the biasing means to release the ball.

4,507,035

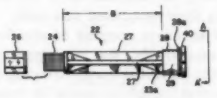
IMPACT RESISTANT ASSEMBLY

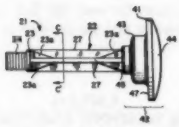
Edward Monett, Westfield, N.J., assignor to Roller Corporation of America, South Plainfield, N.J.

Filed Nov. 18, 1983, Ser. No. 553,040

Int. Cl.³ A63D *5/00*; F16B *23/00*

U.S. Cl. 411—377 **10 Claims**





1. An impact resistant assembly, adapted for use in combination with an impact resistant board, which comprises: (i) a longitudinal molded shaft having screw thread means at the lower end of said shaft for removably securing said assembly to said board, and at the upper end thereof a planar head plate and a cylindrical shaft section adjacent to said head plate; (ii) metal collar means for supporting said head plate and said adjacent upper cylindrical shaft section against substantial deformation under thermosetting molding conditions; and (iii) a resilient head member molded about said head plate and metal collar means and formed from an impact resistant thermosetting material.

4,507,036

INNER BOOK CLAMP

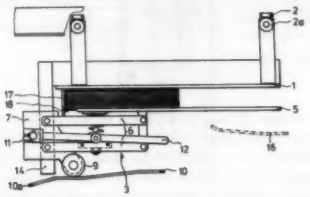
Horst Rathert, Minden, Fed. Rep. of Germany, assignor to Rahdener Maschinenfabrik August Kolbus, Rahden, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,048

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207102

Int. Cl.³ B42C *13/00, 5/00*; B42B *9/00*

U.S. Cl. 412—9 **20 Claims**



1. In a book manufacturing system, the system having continuously operable conveying means for transporting partially completed books between work stations, the conveying means including plural spaced apart clamps, an improved clamp comprising:

inner clamp jaw means, said inner clamp jaw means including a clamp plate;

means for imparting motion in a first direction along a predetermined path to said inner jaw means;

outer clamp jaw means, said outer jaw means including a clamp plate;

means for coupling said outer jaw means to said inner jaw means whereby said outer jaw means will move in said first direction with said inner jaw means, said coupling means permitting said outer jaw means to move along an axis which is generally transverse to said first direction to thereby vary the spacing between said clamp jaw means clamp plates;

means for imparting motion to said coupling means whereby said outer clamp jaw means clamp plate may be caused to move along said axis in the closing direction generally toward said inner clamp jaw means clamp plate;

self-locking means for fixing the spacing between said jaw means clamp plates in response to a force in the opening direction on said outer jaw means; and

unlocking means, said unlocking means cooperating with said self-locking means to permit movement of said outer jaw means clamp plate in the opening direction.

4,507,037

APPARATUS AND METHOD FOR HEAD AND TAIL TRIMMING BOOKLETS

Harry L. Fenimore, P.O. Box 1222, Chickasha, Okla. 73018

Filed Dec. 20, 1982, Ser. No. 451,681

Int. Cl.³ B42C *13/04, 19/12*; B26D *7/06*

U.S. Cl. 412—11 **13 Claims**

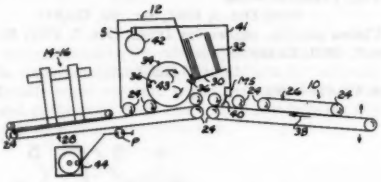
1. In a booklet binding machine having a housing defining a travel path for moving a series of collated signatures in single file therethrough and having a cover signature station adjacent the travel path, including an electrically operated mechanical clutch drivably connected with a transfer drum, and a jogging

and stitching station for center stitching the signatures, the improvement comprising:

sensing means including an electrical switch having a switch arm interposed in the travel path for connecting a source of electrical energy with and actuating said clutch to angularly rotate the transfer drum and deposit a cover signature in the travel path in leading edge register with a signature or signatures in response to the leading edge of a signature or signatures contacting said switch arm.

8. In a booklet binding machine having a housing defining a travel path for moving a series of collated signatures in single file therethrough and having a jogging and stitching station for center stitching the signatures, the improvement comprising:

slitting means disposed transversely of the travel path for head
and tail trimming the stitched signatures,



said slitting means including, a pair of arbors journalled in vertically spaced relation by said housing and forming a continuation of the travel path therebetween,

a pair of circular blades secured to each arbor of said pair of arbors in cooperative signature slitting relation on opposing sides of the travel path,

means for angularly rotating the lowermost arbor at a rate cooperative with the movement of the signatures along the travel path and angularly rotating the uppermost arbor at a rate greater than the rate of angular rotation of the lowermost arbor, and,

signature feed and presser roller means mounted respectively on the lowermost and uppermost arbor for cooperative rotation about the axis of the respective arbor with the rate of travel of the signatures.

4,507,038

BAG-COLLECTING DEVICE

Michel L. Lequeux, Wellin, Belgium, assignor to Minigrip-Belgium, Molenbeek-St. Jean, Belgium

Filed Mar. 9, 1982, Ser. No. 356,401

Claims priority, application Belgium, Mar. 12, 1981, 81/200275.6

Int. Cl.³ B65H *33/00*

U.S. Cl. 414—27 **9 Claims**

1. Device for collecting bags, to be associated with a machine for manufacturing or filling bags one by one, particularly plastic bags which are each provided along the one edge in parallel relationship with the bag-movement direction inside said machine, with a hook which projects relative to said bag and the opening of which faces the collecting device, which comprises a fixed rod facing downwards, which is arranged in the path of the bag discharged from the machine outlet and with such a spacing therefrom that said rod enters the bag hook opening when the bag is moving, the rod cross-section being smaller than the inner cross-section of said hook to let those hooks which are slipped over said rod, slide along same to have the bags pile up by gravity on the rod, means being provided on said rod with such an arrangement as to prevent the bag hooks falling by gravity from the lower free end of said rod.

4,507,039

AUTOMATIC PARISON FEED SYSTEM

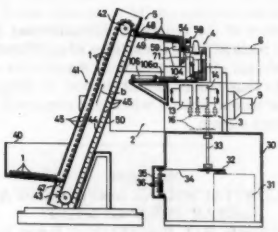
Yuji Sawa, and Yozo Kudo, both of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Feb. 15, 1983, Ser. No. 466,526

Claims priority, application Japan, Feb. 18, 1982, 57-24832; Feb. 18, 1982, 57-24833; Feb. 18, 1982, 57-21739[U]

Int. Cl.³ B65G *25/00*

U.S. Cl. 414—152 **10 Claims**



1. An automatic parison feed system for feeding parisons one at a time onto parison pins projecting at predetermined intervals from an endless conveyor, the conveyor and pins moving in a furnace, the system comprising:

an opening in an upper wall of the furnace and a shutter to open and close the opening;

parison loading means for holding a parison substantially vertically, the parison loading means being above the opening;

parison feed means for feeding parisons one at a time to the parison loading means;

means for retracting the shutter from the opening;

means for lowering the parison loading means through the opening to a predetermined position within the furnace, to feed a parison onto a parison pin;

means for then raising the parison loading means from the furnace;

and means for then returning the shutter to close the opening.

4,507,040

METHOD AND APPARATUS FOR TRANSPORTING CIGARETTES OR THE LIKE BETWEEN PRODUCING AND PROCESSING MACHINES

Horst Baese, and Gerhard Tolasch, both of Wentorf, Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,261

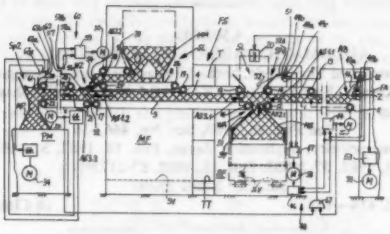
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116105

Int. Cl.³ B65G *47/52*

U.S. Cl. 414—403 **19 Claims**

11. Apparatus for transporting multi-layer streams of rod-shaped articles of the tobacco processing industry, comprising a conveyor system which defines an elongated path; means defining in said path a stationary junction, said conveyor system comprising first conveyor means for delivering to the junction a first article stream along said path; means for estab-

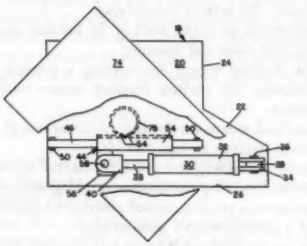
lishing and continuously maintaining at said junction a portion of a second article stream, said conveyor system further comprising second conveyor means for advancing from the junction a third article stream past and in contact with the articles of said portion of the second stream; and means for at least intermittently moving the second stream relative to the junction irrespective of the ratio of articles forming the first and third streams so as to place the articles of a different portion of the second stream into contact with the articles of the third stream and to thus reduce the likelihood of damage to those articles of the second stream which are contacted by the articles of the third stream.



4,507,041
LOAD-TILT ATTACHMENT EMPLOYING A PINION GEAR ARRANGEMENT

William H. Church, P.O. Box 157, and James E. Teichman, 4689 Tabor Rd., both of Sodus, Mich. 49126

Filed Sep. 15, 1982, Ser. No. 418,220
Int. Cl.³ B66F 9/16
U.S. Cl. 414—641 22 Claims

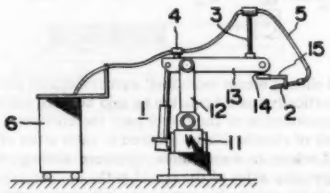


1. An improved load-tilt attachment mountable on the upright of a vehicle, said load-tilt attachment comprising a rear plate, a linear guide rail rigidly secured to the rear plate to receive a longitudinal gear section for reciprocal movement thereon, means for reciprocally moving the longitudinal gear section along the guide rail, said means displaced from and in parallel alignment with the guide rail, plate rotary support means mounted on the rear plate, a front plate mounted on the plate rotary support means for rotary movement of the front plate with respect to the rear plate, mounting means on the front plate comprising a central opening received on the rotary support means of the rear plate and rotary gear means rigidly mounted on the front plate and aligned with the central opening therein, the rotary gear means engaging and intermeshing with the longitudinal gear section of the rear plate when the front plate is mounted on the rotary support means to place the rear plate and the front plate in assembled relation, means for retaining the rear plate and the front plate in assembled relation, the improvement comprising a particular arrangement of the elements recited above, wherein the guide rail is displaced from the rear plate, the reciprocal moving means is displaced from the plate and mounted for reciprocally moving the longitudinal gear section, the reciprocal moving means having opposite ends, with a first end of the reciprocal moving means fixedly secured to the rear plate and an opposite end of the reciprocal moving means fixedly secured to the longitudinal gear section mounted on the guide rail to maximize stability therebetween, the guide rail and the reciprocal moving means are aligned in generally parallel alignment and such parallel alignment is maintained during the reciprocal movement of the longitudinal gear section along the longitudinal axis of the guide rail.

4,507,042
CABLE SUPPORT OF A ROBOT

Takeo Suzuki; Yoshihiro Yurita, and Hideharu Zenpo, all of Kitakyushu, Japan, assignors to Yaskawa Electric Mfg. Co., Ltd., Fukuoka, Japan

Filed Oct. 5, 1982, Ser. No. 432,833
Claims priority, application Japan, Oct. 7, 1981, 56-160756; Oct. 7, 1981, 56-149885[U]
Int. Cl.³ B25J 9/00
U.S. Cl. 414—680 3 Claims



1. A cable support of a robot comprising
(a) an operating arm provided with a wrist arm at one end thereof for supporting a working tool,
(b) a movable support mounted on a wrist-side end of said operating arm, said movable support consisting of a first rotary shaft rotatably mounted on said operating arm and a cable holder tiltably supported on said first rotary shaft,
(c) an auxiliary support mounted on other end of said operating arm, said auxiliary support consisting of a second rotary shaft rotatably mounted on said operating arm and a cable clamp mounted on said second rotary shaft at a height lower than a mounting position of said cable holder, and
(d) a cable overhanging on said cable clamp and on said cable holder and connected to said working tool.

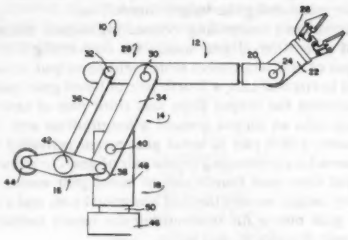
4,507,043
COUNTERBALANCE ROBOT ARM

Carl R. Flatau, Middle Island, N.Y., assignor to Textron, Inc., Providence, R.I.

Filed Sep. 14, 1982, Ser. No. 417,231
Int. Cl.³ G66C 23/00
U.S. Cl. 414—719 15 Claims

1. Counterbalanced robot apparatus comprising a main arm having first and second substantially parallel main arm sections respectively having proximal and distal ends, a shoulder trunion connected to one of the sections between proximal and distal ends thereof, a forearm assembly having an elbow section with first and second pivots, the distal ends of the first main arm section being connected to the first pivot, and the distal end of the second main arm section being connected to the second pivot, a drive arm having an outer end and an inner end, a first pivotal connection at the inner end pivotally connected to the first main arm section near a proximal end thereof, a second pivotal connection at a medial portion of the drive arm pivotally connected to the second main arm section near a proximal end thereof, drive motor means connected to the drive arm at an outer end remote from the first and second

main arm sections, drive means connected to the motor means, to at least one of the substantially parallel main arm sections and to the drive arm for changing the angular relationship between the drive arm and at least one of the main arm sections, and means, including the substantially parallel main arm sections, the forearm assembly and the drive arm, for maintaining substantially equal opposite angles between the forearm assembly and at least one main arm section and between that one main arm section and the drive arm.

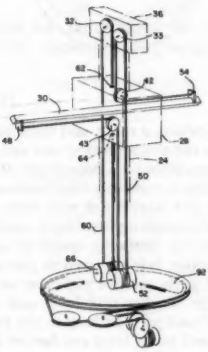


4,507,044

ROBOT AND CONTROL SYSTEM

Burleigh M. Hutchins, Hopkinton; Raymond R. Dunlap, Uxbridge, and Louis Abrahams, Worcester, all of Mass., assignors to Zymark Corporation, Hopkinton, Mass.

Filed Dec. 8, 1981, Ser. No. 328,726
Int. Cl.³ B66C *23/16*
U.S. Cl. 414—744 R **6 Claims**



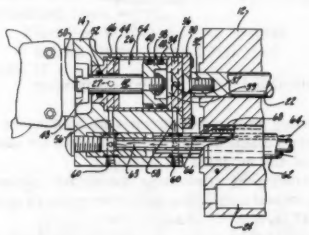
1. In a robot apparatus of the type comprising means to move a robot arm in a vertical direction, and in a horizontal direction substantially co-axial with said arm, and means to rotate said arm through a plane co-planar with said horizontal direction, the improvement wherein the means to move comprises motor means mounted on a horizontal turntable with winch means for operating horizontal cable means and vertical cable means, respectively, and the means to rotate comprises a turntable-rotating motor; means with winch means for operating said turntable and said vertical cable means comprising a first cable means for moving said robot arm vertically, and first cable means being fastened at each end to an arm-holding bracket adapted to slide on vertical tracks and said first cable means being looped around a winch which is part of said winch means for operating the vertical cable means proximate the bottom of said track and around a pulley proximate the top of said track, and said horizontal cable means comprising a second cable means to move said arm horizontally through said bracket, said second cable means having ends of which are attached to said arm near the ends of said arm on opposite sides of said bracket; and wherein the second cable means runs from one said cable end to a pulley in said bracket downwardly to a pulley mounted proximate the top of said vertical track, downwardly around a second pulley attached to said bracket and thence to the other of said cable ends.

4,507,045

ROBOTIC MANIPULATOR INCLUDING ACTUATING UNIT

Al L. Valentine, Southfield; Bernard Rinke, Troy, and Chester M. Wenzel, Royal Oak, all of Mich., assignors to State Die & Engineering, Inc., Roseville, Mich.

Filed May 5, 1982, Ser. No. 374,831
Int. Cl.³ B25J *15/00*
U.S. Cl. 414—753 **1 Claim**



1. Apparatus for manipulating a workpiece, comprising:

a support,

actuatable means for selectively engaging said workpiece and having a reciprocable input for actuating and deactuating said engaging means;

means for mounting said engaging means for reciprocable movement on said support, said mounting means including

(1) a mounting head for unitary, substantially solid construction,

(2) means for mounting said engaging means on said mounting head,

(3) means connected between said support and said mounting head for driving said mounting head to reciprocate and for slideably supporting said mounting head in spaced relationship to said support, and

(4) means including an elongate rod connected between said support and said mounting head for preventing rotation of said head about the axis along which said head reciprocates; and

means for actuating and deactuating said actuatable means, said actuating and deactuating means and including

(1) a first bore in said mounting head and defining a fluid chamber,

(2) a piston slideably disposed within said fluid chamber,

(3) means for drivingly connecting said piston with said reciprocable input,

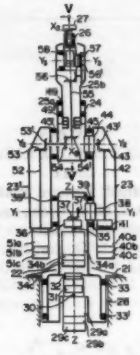
(4) a pair of coaxial, cylindrical fluid conduits within said rod for delivering fluid to and from said head for respectively actuating and deactuating the actuating means, and

(5) means within said head for placing said fluid delivering means in fluid communication with said fluid chamber.

4,507,046
ARTICULATED INDUSTRIAL ROBOT

Noboru Sugimoto, Yokosuka; Yoshio Matsumoto, Yokohama; Michio Takahashi, Yokohama; Michinaga Kohno, Yokohama, and Shiyuki Sakaue, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,637
Claims priority, application Japan, Jul. 21, 1980, 55-98759
Int. Cl.[3] B25J 9/00
U.S. Cl. 414—735 3 Claims

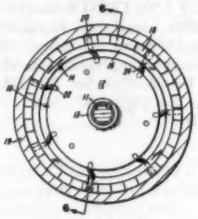


1. An articulated industrial robot comprising:
a base;
a supporting post mounted on said base to be rotatable around a vertical axis, a first drive motor for said supporting post and mounted on said base;
a supporting post connecting means for connecting the output of said supporting post drive motor to said supporting post through a reduction gear;
a first safety brake means provided in said supporting post connecting means and interposed between the output of said supporting post drive motor and said reduction gear;
a wrist for supporting a tool mount and a tool drive motor which drives said tool mount through a reduction gear;
a forearm provided at a tip end thereof with said wrist which is rotatable around a first horizontal axis;
a pair of upper arms each having a forward end pivotally connected to said supporting post to be rotatable around a second horizontal axis and a rearward end rotatable about a third horizontal axis, said upper arms being disposed at both outer sides of said supporting post and said forearm;
an upper drive motor mounted in said supporting post for providing an upward rotary output;
upper arm connecting means including a first pair of bevel gear means for converting the upward rotary output of said upper arm drive motor into an output around the second horizontal axis, and a reduction gear means for transmitting the output around the second horizontal axis to one of said upper arms;
a second safety brake means provided in said upper arm connecting means and interposed between the rotary output of said upper arm drive motor and said bevel gear means;
a further drive motor for said forearm provided at a rearward end of one of said upper arms with a rotary output of the further drive motor being directed toward the tip end of said upper arms along a length thereof;
a forearm means including a second pair of bevel gear means for converting the rotary output of said drive motor for said forearm to an output around the third horizontal axis and a reduction gear means for transmitting the output around the third horizontal axis to said forearm;
a third safety brake means provided in said forearm connecting means and interposed between the rotary output of said drive motor for said forearm and said second pair of bevel gear means;
a wrist drive motor provided at a rearward end of the other of said upper arms, with a rotary output of the wrist drive motor being directed toward a tip end of the other of said upper arms along the length thereof; and
a wrist posture controlling connecting means including a third pair of bevel gear means for converting the rotary output of said wrist drive motor into an output around the third horizontal axis, a fourth pair of bevel gear means for converting the output from said third pair of bevel gear means into an output around a longitudinal axis of said forearm, a fifth pair of bevel gear means provided in said forearm for cooperating with a pair of gears to convert the output from said fourth pair of bevel gear means into a rotary output around the first horizontal axis, and a reduction gear means for transmitting the rotary output from the pair of gears to said wrist.

4,507,047
HOOP TURBINE

Terry L. Coons, Dayton, Ohio, assignor to Tech Development Inc., Dayton, Ohio

Filed Feb. 28, 1983, Ser. No. 470,089
Int. Cl.[3] F01D 21/00
U.S. Cl. 415—9 16 Claims



1. Apparatus comprising a rotor, said rotor being a unitized structure including a radially outermost part and a part radially inward thereof, means defining a connection of said parts the form of which provides a relatively fixed relation of said parts on the energization and start up of said rotor and until the speed of its rotation reaches a preset level, said level not exceeding, perceptibly, the operating speed of said rotor, said parts and said connection being formed to provide a displacement of one of said parts relative the other as the speed of rotation of said rotor reaches said level and to maintain a displaced relation of said parts as long as the rotor speed remains at or is above said preset level and further means interrelating with said parts to effect and maintain a coupled relation of said parts during the period of their relative displacement, as long as the speed of rotation of said rotor does not exceed its designed limit.

4,507,048
CENTRIFUGAL CLINICAL BLOOD PUMP

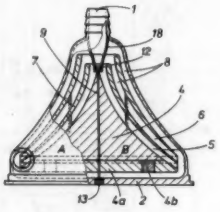
Jacques Belenger, 10, Rue Centrale, 1248 Geneva, Switzerland, and Alain Jeanjacquot, 74560 Monnetier-Mornex, France

Continuation-in-part of Ser. No. 124,222, Feb. 25, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 347,041
Claims priority, application France, Mar. 16, 1979, 79 07699
Int. Cl.[3] F04D 29/22
U.S. Cl. 415—90 11 Claims

1. A clinical centrifugal pump especially for pumping blood or other biological fluid, comprising:
a generally conical housing having a circular base and conical side wall defining a generally concial pump chamber with a central fluid inlet at the apex of the housing and a peripheral outlet adjacent the base of the housing,

a generally conical rotator rotatable in said housing and comprising a central cone having a base and an apex and means on said central cone for impelling flow from said inlet to said outlet upon rotation of said rotator,

means rotatably supporting said rotator in said housing consisting of a first jewelled pivot at the center of the base of said housing and a second jewelled pivot supported in the apex of said housing coaxially with said inlet by a



spider permitting flow of fluid from said inlet into said housing, said rotator being rotably supported solely by said jewelled pivots, and

means for driving said rotator comprising spaced magnets in the base of said central cone in position to be driven by a rotating magnetic field at the base of said housing,

said pump being free of any seals or journal bearing exposed to the interior of said pump chamber.

4,507,049

WHEEL INTENDED TO WORK WITH A FLUID

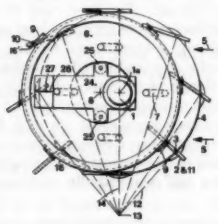
Carl B. Strandgren, 12 chemin de la Plaisante, 1012 Lausanne, Switzerland

Filed Jun. 18, 1982, Ser. No. 390,029

Claims priority, application Switzerland, Jun. 19, 1981, 4061/81

Int. Cl.³ F03D 7/06

U.S. Cl. 416—51 **2 Claims**



1. In a wheel intended to work with a fluid comprising a plurality of wing-shaped components (2) arranged around a central shaft (1) and pivoted between two circular supports (4,4a) along a pivoting axis parallel to said central shaft (1), the movement of said wing-shaped components (2) around their pivoting axis being periodic and the period being the same as that of a revolution around the central axis (1), said wheel comprising means for controlling the movement of said wing-shaped components so that, in each angular position of the wheel during its rotation around the central shaft, the planes aligned along the pivoting axes of said components and perpendicular to the main planes of the latter intersect along a single straight line at a point which is located on the outside of a cylinder generated by the axes of said components during their rotation around the central shaft and which is included in the plane passing through the central axis and perpendicular to the direction of movement of the fluid, said means for controlling the movement of said wing-shaped components comprising at least one annular part (6) with an axis of rotation parallel to but distinct from the axis of rotation of said central shaft (1), rods (7) connecting said annular part (6) to one of said circular supports (4,4a) so as to assure an identical angular movement of said annular part (6) around its axis of rotation and the rotation of said wheel around said central shaft (1), a slide (11) fixedly connected to each of said wing-shaped components (2), the improvement comprising: means (9,16) to permit adjustment of the speed of rotation of said wheel, said means comprising a plurality of rods (9) rigidly attached to said annular part (6) at the outer periphery thereof, said rods being equal in number to the number of wing-shaped components (2) and oriented tangentially to said annular part (6), a guide part (10) mounted on each of said rods (9), each said slide (11) being parallel to the main plane of its related wing-shaped component (2) and cooperating with a related guide part (10), a rotatable ring (16) overlying said annular part (6), means on said ring engaging each of said guide parts (10) whereby upon rotation of said ring (16) all of said guide parts (10) and said rods (9) are moved simultaneously in a perpendicular manner relative to said annular part (6).

4,507,050

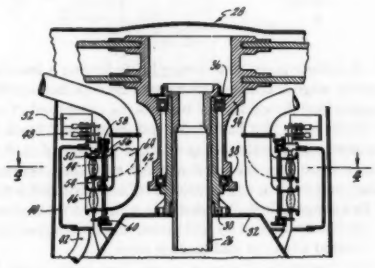
PNEUMATIC VALVE CONTROL FOR CIRCULATION CONTROL AIRCRAFT

Philip A. E. Jeffery, Trumbull, and Thomas H. Lawrence, Seymour, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 9, 1983, Ser. No. 559,995

Int. Cl.³ B64C 11/24; F01D 5/18

U.S. Cl. 416—90 A **10 Claims**



1. A circulation control rotor system for an aircraft having rotor blades and ducts in said blades for receiving compressed air for collective and cyclic pitch control, a compressed air system including an annular plenum chamber for receiving compressed air, valves for controlling the flow of compressed air from said plenum chamber to said blade ducts, actuator means for positioning each valve and means connecting each actuator to a single valve characterized by means interconnecting said connecting means, and means for said interconnecting means to position any valve having disabled actuator means.

8. In a circulation control rotor system for an aircraft, an annular plenum chamber for receiving compressed air, a plurality of valves around a circumference of said plenum chamber for controlling the discharge of air from said plenum chamber, an actuator connected to each valve to operate the valve, linkage interconnecting said valves including springs loaded in compression between adjacent valves, each actuator being of the hydraulic type and including piston means working in a cylinder and having a connection with an associated valve, servo means receiving a control input from the aircraft pilot for operating said piston to establish valve position in accordance with said control input, bypass valve means controlling fluid flow to said piston, fluid flow restricting means adapted to be connected to opposite sides of said piston by said bypass valve means, and means operatively connected to said piston for providing a feedback signal to said control input and a

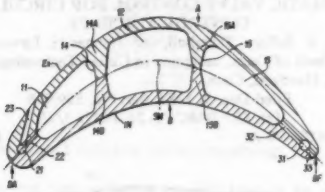
monitor signal of vane position, said bypass valve means having a first position providing actuator operation of said valve in response to said control input and a second position permitting fluid flow from opposite sides of said piston through said fluid flow restriction and disconnecting said actuator when said monitor signal indicates a vane position different than said control input, said springs adjacent said valve positioning said valve when said bypass valve is in said second position.

4,507,051

GAS TURBINE BLADE WITH CHAMBER FOR CIRCULATION OF COOLING FLUID AND PROCESS FOR ITS MANUFACTURE

Jacques Lesgourgues, Corbeil, and Jacques P. H. Tirole, Chilly Mazarin, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Nov. 10, 1982, Ser. No. 440,743
Claims priority, application France, Nov. 10, 1981, 81 20995
Int. Cl.³ F01D 5/08
U.S. Cl. 416—97 R **3 Claims**



1. A hollow metal gas turbine blade having a leading edge, a trailing edge, a concave face and a convex face extending in a longitudinal direction, said blade being composed of a second half blade and a first half blade, and second half blade defined by a portion of said leading edge, a portion of said trailing edge, said convex face and a plane extending between said leading and trailing edges, said first half blade comprising:

a first longitudinal depression in a first surface of said first half blade defined by said plane, said first depression being located adjacent said leading edge;

a first longitudinal groove in said first surface and located between said leading edge and said first depression, said first longitudinal groove extending along said first half blade through the length of said leading edge and said first longitudinal depression;

an array of second groove in said first surface, each of said second groove extending transverse to said first groove and parallel to said plane, each of said second groove connecting said first depression and said first groove;

an array of first bores only in said first half blade, each of said first bores extending at an angle with respect to said plane and connecting said first groove with a foreward portion of said convex face;

a second longitudinal depression in said first surface of said first half blade, said second depression being located adjacent said trailing edge;

a third longitudinal groove in said first surface and located between said trailing edge and said second depression;

an array of fourth grooves in said first surface, each of said fourth grooves extending transverse to said third groove and parallel to said plane, each of said fourth grooves connecting said third groove to said second depression; and

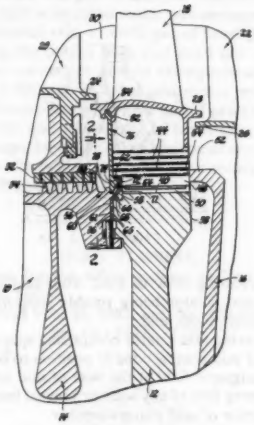
an array of fifth grooves in said first surface, each of said fifth grooves extending parallel to each of said fourth grooves, each of said fifth grooves connecting said third groove to said trailing edge.

4,507,052

END SEAL FOR TURBINE BLADE BASES

Douglas K. Thompson, Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1983, Ser. No. 480,831
Int. Cl.³ F01D 5/30
U.S. Cl. 416—193 A **3 Claims**



1. In a gas turbine rotor assembly including a wheel having a circumferential array of retention slots and a plurality of air cooled blades having bases disposed in respective ones of said retention slots, said bases cooperating with said respective ones of said slots in defining a plurality of manifolds supplied with pressurized air from a first side of said wheel, an end seal for each of said manifolds at a second side of said wheel comprising, a seal ring having an annular planar portion and a cylindrical flange radially outboard of and perpendicular to said planar portion, means for axially clamping said seal ring planar portion against said second side of said wheel with a circle of contact radially inboard of each of said slots so that a 360° inboard seal is defined, means on said wheel and on each of said blade bases defining a continuous radially inwardly facing cylindrical shoulder dispose l radially outboard of each of said manifolds, said flange being disposed radially inboard of and adjacent said cylindrical shoulder, and centrifugal clamp means on said wheel engageable on said flange under the influence of centrifugal force during rotation of said wheel to radially clamp said flange against said cylindrical shoulder and thereby provide a 360° seal radially outboard of each of said manifolds.

4,507,053

PUMP OFF CONTROL

Marvin L. Frizzell, P.O. Box 666, Bangs, Tex. 76823

Filed Jun. 15, 1982, Ser. No. 388,651
Int. Cl.³ F04B 49/02, 49/06
U.S. Cl. 417—12 **10 Claims**

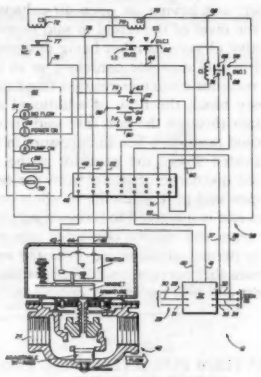
1. In a submersible pump assembly of the type having a motor and pump connected together so that when the pump inlet is positioned below the liquid level of a borehole, a motor controller energizes the pump motor which drives the pump to force production fluid from the pump to flow to the surface of the ground, the combination with said pump motor and pump of a pump-off controller;

said pump-off controller includes flow responsive switch means, a first time delay relay, a second time delay relay, an operating switch, and a running relay;

circuit means connecting said operating switch to said second time delay relay to provide a starting circuit which is connected to cause said running relay to close and thereby

connect said motor controller to start said pump motor and to continue to run said pump motor until said second time delay relay times out;

said flow responsive switch means is actuated from a no-flow to a flow position when said pump produces a suitable flow of fluid, circuit means connected to hold said



running relay in the operating position so long as said flow responsive switch means is in the flow position; thereby obviating the action of said second time delay relay;

circuit means by which said first time delay relay is energized when the flow responsive switch means assumes the no-flow position and the second time delay relay has timed out.

4,507,054

LIQUID DISPENSING SYSTEM

Ivar L. Schoenmeyr, El Toro, Calif., assignor to Carr-Griff, Inc., Anaheim, Calif.

Filed Jun. 28, 1982, Ser. No. 392,709
Int. Cl.[3] **F04B** *49/02, 49/06, 49/08*
U.S. Cl. 417—12 **10 Claims**

1. A pumping system comprising:

a pump for pumping liquid, said pump having an inlet and an outlet and including a movable pumping member for pumping the liquid;

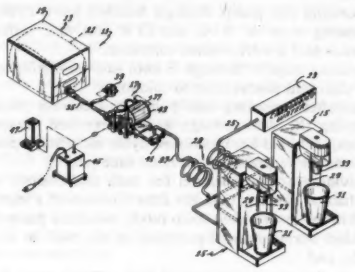
inlet check valve means on the inlet side of the pumping member for allowing the flow of liquid toward the pumping member and substantially preventing reverse flow through the inlet check valve means;

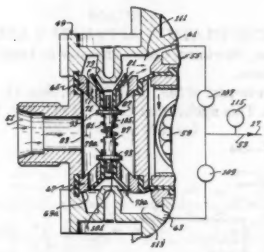
outlet check valve means on the outlet side of the pump for allowing the flow of liquid downstream away from the pumping member and substantially preventing reverse flow through the outlet check valve means;

bypass means responsive to the pressure in a pumping zone between the inlet check valve means and the outlet check valve means reaching a predetermined level for allowing some of the liquid in said pumping zone to pass out of said pumping zone without being pumped by said pumping member through said outlet check valve means;

control means responsive to the pressure of the liquid pumped by the pumping member for at least partially controlling the operation of the pump;

said pump having first and second pumping chambers and said pumping member moving in both of said pumping chambers such that the first chamber is on intake and discharge strokes when the second chamber is on discharge and intake strokes, respectively, said inlet check valve means including first and second inlet check valves for allowing flow of liquid toward the first and second pumping chambers, respectively, and for preventing reverse flow from the pumping chambers through said inlet check valves, said pumping zone including a first portion which includes the first pumping chamber and a second portion which includes the second pumping chamber, said bypass means including first and second passages leading from said first and second portions, respectively, and first and second valve elements and biasing means for urging said first and second valve elements away from each other to close the first and second passages, respectively; and





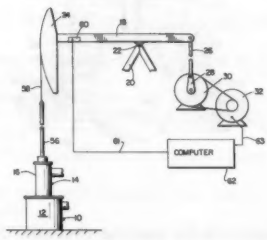
said first valve element includes a tubular section and said second valve element includes a stem slidably receivable in said tubular section to at least assist in mounting said valve elements for movement toward and away from each other.

4,507,055

SYSTEM FOR AUTOMATICALLY CONTROLLING INTERMITTENT PUMPING OF A WELL

John C. Fair, Allison Park, Pa., and Kenneth R. Ferguson, Lafayette, La., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1983, Ser. No. 514,621
Int. Cl.[3] **F21B** *43/12;* **F04B** *49/02, 49/06*
U.S. Cl. 417—12 **14 Claims**



1. A method for automatically controlling the intermittent pumping of a well by a pump comprising the steps of:

A. operating the pump in a learn mode by pumping the well

through at least two cycles, each cycle including a learn run and a preset deactivated time period;

B. terminating each learn run at pump-off;

C. determining the time difference between the time durations of the last two learn runs;

D. comparing said time difference to a predetermined tolerance;

E. operating the pump through another learn cycle and repeating steps A, B, C and D if said time difference exceeds said predetermined tolerance;

F. repeating steps A through E until said time difference is less than said predetermined tolerance;

G. thereafter operating said pump in a control mode by pumping the well through a predetermined number of cycles, each said last mentioned cycle including a production run and a preset deactivated time period;

H. providing a time duration for each said control mode production run less than the time duration of a learn run used in the most recent learn mode, whereby pump-off is avoided during normal pumping of the well in control mode; and

I. setting the preset deactivated time periods used in said control and learn modes to be equal to each other.

4,507,056

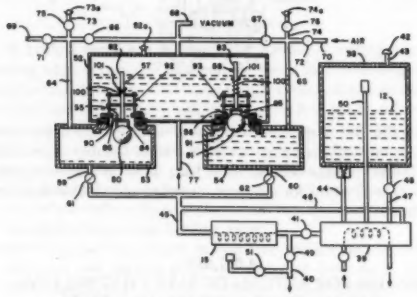
LIQUID CIRCULATION APPARATUS AND METHOD

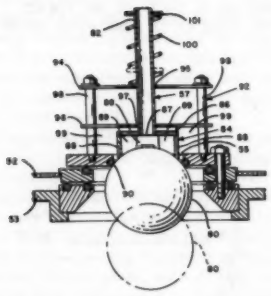
Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Bethel, Conn.

Continuation-in-part of Ser. No. 301,358, Sep. 11, 1981, Pat. No. 4,408,960. This application Oct. 3, 1983, Ser. No. 538,219

Int. Cl.³ F04F *00/00*

U.S. Cl. 417—54 **24 Claims**





1. In an apparatus for dumping circulation liquid from a supply container into a reduced-pressure lower receptor container through a connecting port while displacing air from said receptor container, through said port and into said supply container, the improvement which comprises a valve assembly within said port, said assembly having a bouyant valve closure member located beneath said port in the receptor container and an upper air conduit which extends through said port into the supply container, said air conduit having an open air-intake lower end at or below said port, at least when the valve closure member is in open position, to permit air displaced from said receptor container to pass through said air conduit into said supply container, and having an open air-exhaust upper end near or above the level of the liquid in said supply container, said buoyant valve closure member being designed to float at the liquid level in said receptor container so as to close said port when the receptor container reaches filled condition and to simultaneously block the flow of additional air from the receptor container through the port into said air conduit, and to remain in closed position when the pressure in the receptor container is elevated above the pressure in the supply container, during the discharge of liquid from the receptor container, and to open said port when the receptor container is in empty condition and is subjected to reduced pressure, to cause liquid to flow from the supply container into the receptor container and to permit air displaced from the receptor container to flow from the receptor container into said air conduit through said port and into the supply container.

4,507,057

CONTROL SYSTEM FOR HYDRAULIC PUMPS OF A CIVIL MACHINE

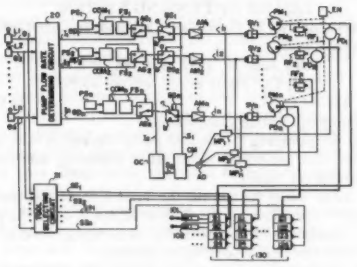
Michiaki Igarashi, Yokosuka; Takayasu Inui, Hirakata; Kazuo Otsuka, Hirakata; Saburo Nogami, Hirakata, and Satoru Nishimura, Hirakata, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 218,914, Dec. 22, 1980,. This application Feb. 18, 1983, Ser. No. 467,961

Claims priority, application Japan, Jan. 7, 1980, 55-449

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—216 **7 Claims**



1. A control system for a plurality of variable type hydraulic pumps driven by an engine of a hydraulic type civil machine which has a plurality of servos, each servo being associated with a pump and responsive to a flow rate signal, for actuating a swash plate of the associated pump, said control system comprising:

detector means for producing a delivery pressure signal for each of the pumps, each delivery pressure signal being indicative of the delivery pressure of hydraulic fluid from an associated pump;

an operational circuit responsive to the detector means, for calculating the output torque of the engine on the basis of the pump delivery pressure signals from the detector means, and the flow rate signals applied to the servos;

a comparing circuit for comparing said output torque with a predetermined torque corresponding to the rated torque of the engine and for producing an output signal when said output torque exceeds said predetermined torque; and

means responsive to the comparing circuit, for applying a predetermined flow-rate command signal to each servo when the comparing circuit provides said output signal so

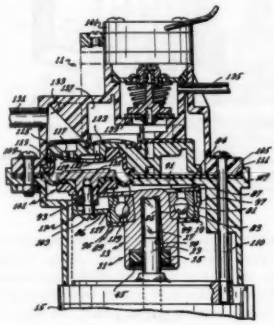
that the hydraulic pumps are driven within the rated torque of the engine.

4,507,058

WOBBLE PLATE PUMP AND DRIVE MECHANISM THEREFOR

Ivar L. Schoenmeyr, Mission Viejo, Calif., assignor to Carr-Griff, Inc., Fullerton, Calif.

Filed Dec. 20, 1983, Ser. No. 565,027
Int. Cl.³ F04B *1/06, 1/18*
U.S. Cl. 417—270 **19 Claims**



1. An apparatus for moving a fluid medium and adapted to be driven by a motor, said apparatus comprising:

a positive displacement member movable on intake and discharge strokes to move the fluid medium;

drive means adapted to be driven by the motor for driving the positive displacement member to move the fluid medium with the fluid medium exerting back pressure on the positive displacement member at least during the discharge stroke;

said drive means including a wobble plate coupled to the positive displacement member for driving the positive displacement member with the wobble plate having an angle which influences the length of said strokes and the volume of the fluid medium moved by the positive displacement member and means responsive to the back pressure on the positive displacement member for adjusting the angle of the wobble plate to change the volume of the fluid medium movable by the positive displacement member;

said back pressure responsive means includes a shaft having an end surface and a coupler having an end wall and a bore extending from said end wall to open at the exterior of the coupler, said bore being oversized relative to said shaft and receiving said shaft with the end surface engaging the end wall and cooperating therewith to define an axis about which the coupler and the shaft can relatively tilt; and

said back pressure responsive means including resilient means for resiliently resisting the relative tilt of the shaft and the coupler in a direction to influence the angle of the wobble plate.

4,507,059

VARIABLE DELIVERY COMPRESSOR

Hisao Kobayashi; Makoto Ohno, and Shinichi Suzuki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisa-Kusho, Kariya, Japan

Filed Jan. 27, 1984, Ser. No. 574,681
Claims priority, application Japan, Feb. 1, 1983, 58-13474[U]
Int. Cl.³ F04B *1/16, 1/18*
U.S. Cl. 417—270 **8 Claims**

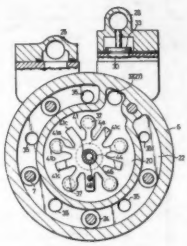
1. A variable delivery compressor for compressing a refrigerant gas of a cooling circuit, comprising:

a cylinder block means having therein a plurality of compression chambers;

housing means having therein a plurality of delivery chambers;

valve plate means interposed between said cylinder block means and said housing means, said valve plate means comprising a plurality of valve plates each having therein a plurality of delivery ports and a suction by-pass aperture providing fluid communications between said compression chambers and said delivery chambers;

delivery valve means comprising a plurality of delivery valves each for opening and closing the delivery ports of one of said valve means, at least one of said delivery valves being movable between a normal closed position, in which it is in contact with the corresponding one of said valve plates to close said delivery ports and said suction by-pass aperture thereof, and an open position, in which it is apart from said valve plate, and being formed with a base portion for effecting said closing of said suction by-pass aperture;



passage means for providing a fluid communication between said delivery chambers and the delivery outlet of said variable delivery compressor; and check valve means disposed in said passage means for opening the same in response to the movement of said movable delivery valve to said normal closed position,

wherein the improvement resides in that said movable delivery valve includes: a flexible base portion having annular shape whose outer circumference is larger than said suction by-pass aperture; a plurality of reed portions formed to radially extend from said outer circumference of said base portion and arranged to face the respective of said delivery ports, and a corresponding plurality of protrusions formed to radially extend from said outer circumference of said base portion respectively between each adjacent pair of said reed portions for suppressing the warp of said outer circumference of said base portion when said movable delivery valve is in said open position during operation of said compressor.

4,507,060

PUSH-PULL WINDMILL HEAD HAVING DOUBLE BEAM PUMPING JACK

Richard K. Sutz, Scottsdale, Ariz., assignor to Wind Baron Corporation, Phoenix, Ariz.

Filed May 26, 1983, Ser. No. 498,307
Int. Cl.³ F04B *17/02;* **F03D** *3/00;* **F16H** *21/32*
U.S. Cl. 417—336 **7 Claims**

1. A push-pull windmill head for driving a pump or the like, comprising:

a stub tower mountable in a stationary position on an elevated support;

a horizontal platform carried by said stub tower;

a transmission mechanism mounted on said platform and having

a rotary driven input shaft, and

a rotary driven output shaft operatively intercoupled with said input shaft and axially perpendicular thereto to

convert rotary input motion at any variable speed to rotary output motion at any other variable speed in a predetermined speed ratio;

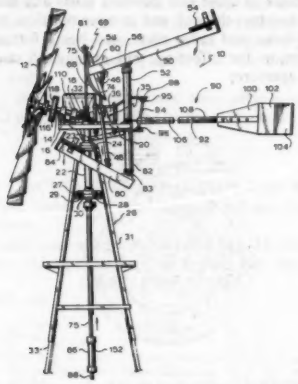
a rotary fan drivable by wind connected to said input shaft to drive the same;

a crank coupled to said output shaft;

a pitman arm coupled to said crank to convert rotary motion of said output shaft to reciprocating motion of said pitman arm;

a walking beam pivotally carried by said platform and connected to said pitman arm laterally of one side of said transmission mechanism for rocking said beam in a vertical plane parallel to said input shaft;

an axially vertical reciprocatable pump rod for lifting a pumped load;



a counterweight carried by said beam to assist said beam in pulling up said pump rod and load;

a first elongated, non-rigid member so connected between one end of said beam and said pump rod that said pump rod is pushed down precisely vertically by said member, and said counterweight is raised by said member, while said beam rocks in one direction in said vertical plane; and

a second elongated, non-rigid member so connected between said one end of said beam and said pump rod that said pump rod and load are pulled up precisely vertically by said second member assisted by said counterweight descending, while said beam rocks in a direction opposite to said one direction.

4,507,061

CHECK VALVE AND PUMP RECEPTOR ASSEMBLY

Stephen N. McEwen, Bowling Green, and Ted W. Guelde, Deshler, both of Ohio, assignors to Henry Filters, Inc., Bowling Green, Ohio

Filed Sep. 14, 1982, Ser. No. 418,079

Int. Cl.[3] **F04B** *35/04;* **G01F** *11/32*

U.S. Cl. 417—360 **10 Claims**

1. A receptor check valve assembly for an inlet of a pump, comprising:

(A) a chamber having a plurality of vertically open apertures associated therewith,

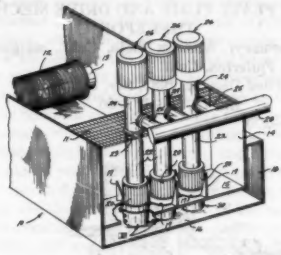
(B) separate removable pumps each having an inlet vertically slideably associated with each said aperture for creating a reduced pressure in said chamber,

(C) a receptor means for each said aperture for the inlet of its associated pump, said receptor means having

(1) a slip-fit hydraulic telescopic connection with said inlet, and

(2) a tapered guide means for said inlet outside said chamber to said telescopic connection,

(D) a check valve means for each said aperture for maintaining said aperture closed when its associated pump is not operating, whereby fluid is prevented from passing through said aperture when another pump is operating to create a reduced pressure in said chamber, and



(E) means for simultaneously connecting said receptor means and said check valve means together and to its associated aperture.

4,507,062

DIAPHRAGM PUMP

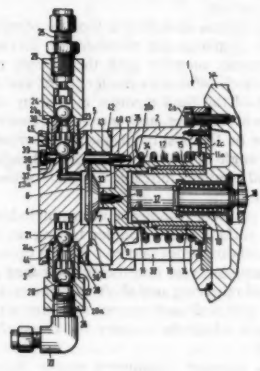
Michael Wally, Bammental, Fed. Rep. of Germany, assignor to Chemie und Filter GmbH, Heidelberg, Fed. Rep. of Germany

Filed Jan. 21, 1983, Ser. No. 459,785

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202148

Int. Cl.[3] **F04B** *9/08, 43/06*

U.S. Cl. 417—413 **20 Claims**



1. A diaphragm pump, especially for metering combustible media, comprising a hollow housing; and a diaphragm installed in and dividing the interior of said housing into a pumping chamber and a second chamber which is normally sealed from said pumping chamber, said housing defining a olurality of gaps connecting said second chamber with the atmosphere and being dimensioned and configurated to prevent the propagation of ignition so that destruction of said diaphragm, with attendant penetration of a combustible medium from said pumping chamber into said second chamber, and eventual ignition of the combustible medium in said second chamber does not result in propagation of ignition from the second chamber to the atmosphere, said gaps constituting the sole means connecting said second chamber with the atmosphere.

4,507,063
GAS-FILLED DAMPING ELEMENT FOR DAMPING PRESSURE PULSATIONS

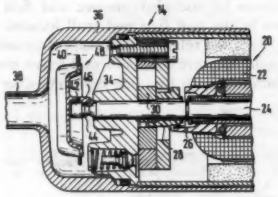
Ulrich Kemmner, Stuttgart, and Stephan Kleppner, Bretten, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 380,011

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134859

Int. Cl.³ F04B *11/00*; F16L *55/04*

U.S. Cl. 417—540 **11 Claims**



1. An arrangement for damping oscillations, especially in a displacement pump, comprising a rigid support member having a border zone delimiting a base area in one plane, an abutment surface situated in another plane extending substantially parallel to said one plane, and a transition zone connecting said border zone with said abutment surface; a flexible diaphragm connected to said support member at said border zone and covering a surface area in said one plane which exceeds the area of said abutment surface in said another plane; said support member and said diaphragm defining an enclosed space between themselves; a body of gaseous medium confined in said enclosed space; said transition zone extending from said border zone into said enclosed space; said abutment surface facing toward said diaphragm and the area of said abutment surface being smaller than said base area, and wherein said support member has a convex outer side formed with a flat rim in said border zone, a bottom wall formed with said abutment surface, and a connecting wall constituting said transition zone; and wherein said diaphragm is arranged opposite the convex side of said support member, is connected to said rim, and extends therefrom spacedly along said transition zone and said bottom wall.

4,507,064
ROTARY GAS COMPRESSOR HAVING ROLLING PISTONS

Erich J. Kocher; Paul G. Szymaszek, both of Milwaukee, and John G. Nikolaus, West Allis, all of Wis., assignors to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Jun. 1, 1982, Ser. No. 384,027

Int. Cl.³ F04C *18/00, 29/02*; F16K *15/02*

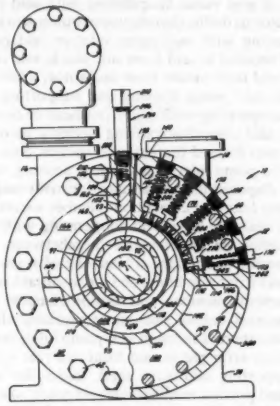
U.S. Cl. 418—15 **9 Claims**

1. A rotary gas compressor comprising:

a housing assembly adapted to be horizontally disposed during operation and a cylinder housing having an outer cylinder wall and a concentric inner cylinder wall defining a cylinder chamber, a vane slot communicating with said cylinder chamber through said inner cylinder wall, a reciprocably movable vane mounted in said vane slot, means for biasing said vane toward said cylinder chamber, a suction chamber communicating with said cylinder chamber through a suction port in said inner cylinder wall on one side of said vane slot, a discharge chamber communicating with said cylinder chamber through a plurality of circumferentially spaced apart discharge ports in said inner cylinder wall on the other side of said vane slot, a plurality of independently operable discharge valve assemblies, one valve assembly for each of said discharge ports;

and a rotor assembly comprising a rotatable shaft mounted on said housing assembly, an eccentric crank arm on said shaft and located in said cylinder chamber, and a roller piston rotatably mounted on said crankarm and engaged with said cylinder wall and with said vane;

each discharge valve assembly including a cage having an opening located near the surface of said inner cylinder wall engaged by said roller piston and a valve seat surrounding said opening;



each discharge assembly valve further including a movable valve member movably mounted in said cage and seatable against said valve seat;

each discharge valve assembly also including biasing means to bias said valve member toward seated position;

said discharge valve assembly being constructed so as to reduce the colume of any waste space in the associated discharge port between said roller piston moving therepast and said cage and the valve member therein when the latter is in seated position.

4,507,065
VANE COMPRESSOR HAVING DRIVE SHAFT JOURNALLED BY ROLLER BEARINGS

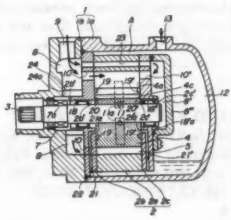
Tsunenori Shibuya, and Teruo Nakamura, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Saitama, Japan

Filed May 5, 1983, Ser. No. 491,858

Claims priority, application Japan, May 13, 1982, 57-70019[U]; May 21, 1982, 57-74332[U]

Int. Cl.³ F04C *18/00, 29/02*

U.S. Cl. 418—15 **13 Claims**



1. A vane compressor comprising: a cam ring having an endless camming inner peripheral surface and opposite ends; front and rear side blocks secured to said opposite ends of said cam ring and forming a pump housing in cooperation with said cam ring, said pump housing having at least one pump inlet and at least one pump outlet, said pump inlet being formed through

at least one of said front and rear side blocks; a cylindrical rotor accommodated within said pump housing, said rotor having an outer peripheral surface thereof formed with a plurality of slits, and having an interior thereof formed with a back pressure chamber communicating with said slits, said rotor having opposite end faces disposed in close proximity to said front and rear side blocks; a plurality of vanes radially slidably fitted in said slits of said rotor for sliding on said endless camming inner peripheral surface of said cam ring, adjacent ones of said vanes cooperating with said pump housing and said rotor to define therebetween pump working chambers communicating with said pump inlet or said pump outlet; a front head secured to said front side block, said rear side block having an end face remote from said rotor; a drive shaft partly disposed in said pump housing and supporting said rotor; a covering cooperating with said front head to form a compressor casing, said compressor casing having a suction port and a discharge port formed therein, said suction port communicating with said pump inlet of said pump housing, said discharge port being disposed for communication with said pump outlet of said pump housing; a partition member secured to said end face of said rear side block and cooperating with said rear side block to define an oil chamber therebetween; at least one suction chamber defined by at least one of a pair of said front head and said front side block and a pair of said rear side block and said partition member, said suction chamber communicating with at least one of said pump working chambers on a suction stroke thereof through said pump inlet; first and second roller bearings arranged in said front and rear side blocks and radially supporting said drive shaft, said roller bearings each having an end portion remote from said rotor, one of said roller bearings having said end portion disposed in said oil chamber; a sealing chamber defined by said front head and said front side block and penetrated by said drive shaft, the other of said roller bearings having said end portion disposed in said sealing chamber; and lubricating oil feeding means including first and second lubricating oil feeding passages formed in said front and rear side blocks and each having one end communicating with oil in a zone under discharge pressure, first and second clearances defined between said opposite end faces of said rotor and said front and rear side blocks, said first and second lubricating oil feeding passages each having another end opening in a corresponding one of said first and second clearances, said first and second clearances communicating, on one hand, with said back pressure chamber, and on the other hand, with a corresponding one of said sealing chamber and said oil chamber, through a corresponding one of said roller bearings; said first and second clearances each have a portion extending between said another end of a corresponding one of said lubricating oil feeding passages and said back pressure chamber, said portion of each of said first and second clearances being adapted to produce such flow resistance as to reduce the pressure of lubricating oil from a level of discharge pressure to a level of back pressure being supplied to said back pressure chamber as the lubricating oil travels through said portion of said each of first and second clearances, said back pressure chamber being supplied with oil solely through said first and second clearances and clearances between said vanes and said rotor slits.

4,507,066

FLUID EXPANSION DEVICE

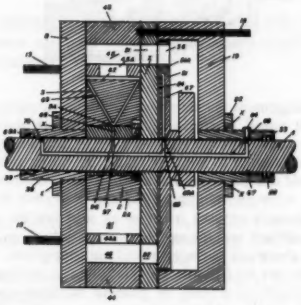
James T. Duffy, 247 Salisbury Sq., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 349,858, Feb. 18, 1982, abandoned. This application Oct. 11, 1973, Ser. No. 540,335

Int. Cl.³ F01C *1/22, 21/04*

U.S. Cl. 418—61 A **6 Claims**

1. A trochoid-type rotary piston gas expansion device including a stationary housing defining an epitrochoidal cavity, generally planar first and second end walls received by said housing on opposite sides of said cavity and having shaft aperture means in aligned relation on opposite sides of said housing where said cavity is symmetrical about a first axis transverse to said end walls, rotatable crank shaft means extending through said shaft apertures and said cavity parallel to said first axis and including an eccentric portion located on said shaft in said cavity, rotary piston means rotatably received on said eccentric portion of said crank shaft so that said axial centerline of said piston describes a circular path about the axis of said shaft in response to rotation of said crankshaft where said rotary piston includes at least three flank surfaces of generally equal length which intersect at apices to determine lines of sealing contact with said walls and housing of said cavity; and wherein said housing means and said rotary piston means include cooperative mating gear means to determine the speed of rotation of said piston means relative to said shaft means and where said rotary piston means accomplishes one revolution for every three revolutions of said shaft means; and first and second endwall inlets in the said first end wall located in generally diametrically opposed relation with respect to said axis of said shaft where said aperture means of said valve means periodically communicates with first one then the other of said first



and second endwall inlets where said first and second endwall inlets communicate, respectively with first and second housing manifolds each having manifold outlet means communicating with said housing and gas outlet guide means to direct said compressible fluid into said expansion chambers defined between said trochoidal cavity and a flank surface of said piston, and in the direction of rotation of said piston means in a generally radial direction with respect to said first axis; outlet means provided in said housing for emission of fluid from said stationary housing when said piston is in selected position; source of pressurized gas; rotary valve means carried by said shaft means and located in contact with said side of one of said first and second end wall for rotation with said shaft having aperture means therein communicating with said source of pressurized gas to be selectively aligned with said inlet means by rotation of said shaft means to selectivly open and close said inlet means to selectively admit gas to said expansion chambers in accordance with the position of said piston surfaces.

4,507,067

ROTARY DEVICE WITH ELLIPTICAL ROTOR IN ELLIPTICAL CHAMBER

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Filed Dec. 6, 1982, Ser. No. 447,448

Int. Cl.³ F04C *2/00, 18/00*

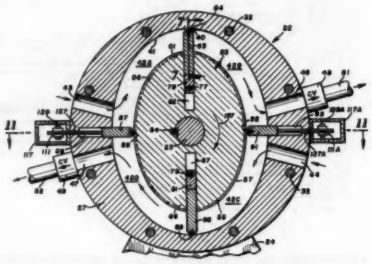
U.S. Cl. 418—105 **25 Claims**

1. A rotary device comprising: housing means having inside generally elliptical surface surrounding chamber for accommodating a fluid, said housing means having fluid exhaust port means,

rotor means rotatably mounted on the housing means located in said chamber, said rotor means having an outside generally elliptical surface having a major dimension substantially equal to the minor dimension of the elliptical surface of the housing means,

first vane means movably mounted on the rotor means for

reciprocal movement toward and away from said inside elliptical surface during rotation of the rotor means, said first vane means having first seal means movably mounted on the outer ends thereof, located in sealing relation with the inside elliptical surface of the housing means, means for biasing the first seal means into engagement with said inside elliptical surface, second vane means movably mounted on the housing means to separate said intake port means from the exhaust port means, said second vane means having a second seal means movably mounted on



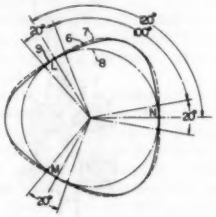
the inner ends thereof and located in sealing relation with the outside elliptical surface of the rotor means, means to bias the second seal means into engagement with said inside elliptical surface, and second means operable to move the second vane means to maintain contiguous sealing relation of the second seal means with said outside elliptical surface of the rotor means whereby on rotation of the rotor means fluid is drawn into the chamber through said intake port means and discharged from the chamber through said intake port means and discharged from the chamber through said exhaust port means.

4,507,068

VANE TYPE ROTARY MACHINE

Isao Hayase, Katsuta; Atsushi Suginuma, Mito, and Atsuo Kishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,369
Claims priority, application Japan, Aug. 26, 1981, 56-133705
Int. Cl.³ F04C *18/00*
U.S. Cl. 418—150 **2 Claims**



1. A vane-type rotary machine having a cylinder provided with an inner peripheral contour expressed by an epitrochoid-like curve having at least one lobe, a cylindrical rotor having a plurality of vane grooves c lapted to contact an inner peripheral surface of said cylinder, and vanes adapted to slide in said vane grooves while making sliding contact with the inner peripheral surface of said cylinder, said rotary machine having at least one portion where a distance between the inner peripheral surface of said cylinder and an outer peripheral surface of said rotor is minimized, an inner peripheral contour of said cylinder is determined a closed c e constituting an inner peripheral contour of said cylinder

$$r = a - b\cos(n\theta),$$

where:

n represents a number of points o tact with the outer peripheral surface of the rotor; a

a and b represent constants;

curves are formed at a plurality of po s around a center of an inscribed circle at an angula rval of 360°/n in accordance with the relationship:

$$r = a - b\cos\left(\frac{360}{\frac{360}{n} - \theta_s}\right),$$

within a range of an angle θ expressed by:

$$0 \leqq \theta \leqq 360/n - \theta_s,$$

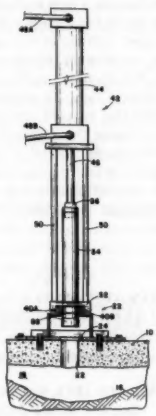
where: θ_s represents a suitable angle; and wherein adjacent curves are connected through arcs conforming with the portions of said inscribed circle, said arcs constituting the portions of said inner peripheral contour corresponding to said angle θ_s.

4,507,069

APPARATUS FOR POSITIONING AND STABILIZING A CONCRETE SLAB

Clarence L. Murray, and John T. Bright, both of Tulsa, Okla., assignors to Foundation Control Systems, Inc., Tulsa, Okla.

Filed Oct. 20, 1983, Ser. No. 543,624
Int. Cl.³ E04B *5/16*
U.S. Cl. 425—59 **8 Claims**



1. Apparatus for positioning and stabilizing a concrete slab resting on support structure and having an opening formed therein, the slab having an upper and a lower surface, comprising:

a plate having an opening therein, the plate being securable to a slab upper surface with the opening therein in alignment with the slab opening;

at least one shaft member downwardly extendable through said openings in said plate and slab openings adapted to engage support structure below the slab;

a jack means supportable to said plate, the jack means including means to downwardly apply a vertical force on

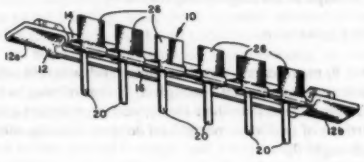
said shaft member to apply a lifting force on the slab whereby the slab may be lifted to the desired height relative to the support structure; and means to flow a slurry through said opening in the slab and under said slab to provide stabilization of the slab after it is lifted to the desired elevation.

4,507,070

APPARATUS FOR RELEASABLY RETAINING A CONFECTION STICK

Robert G. Armstrong, Fitchburg, Mass., and Richard L. Stewart, Anaheim, Calif., assignors to Popsicle Industries, Inc., Englewood, N.J.

Filed Jan. 13, 1984, Ser. No. 571,046
Int. Cl.³ B29C *1/00;* B29D *3/00;* A23G *3/18*
U.S. Cl. 425—126 S **6 Claims**



1. In a machine for forming a confection on a stick, an apparatus for engaging and releasably retaining the stick during at least a portion of the confection forming process, the apparatus comprising:

an extractor member having an upper surface and an under surface and having a slot extending therethrough from the under surface to the upper surface, the slot being dimensioned to receive at least one confection stick;

a one-piece plastic retainer member comprising an arcuate sleeve portion having a first end which engages the under surface of the extractor member and a second end which engages the upper surface of the extractor member proximate the slot, a retainer blade portion extending outwardly from the arcuate sleeve portion proximate the second end thereof and an actuator portion extending outwardly from the arcuate sleeve portion, the arcuate sleeve portion urging the retainer blade portion into engagement with a confection stick received within the slot, the actuator portion facilitating movement of the retainer blade portion against the urging of the arcuate sleeve portion to disengage the retainer blade portion from the confection stick.

4,507,071

COEXTRUSION APPARATUS FOR PRODUCING MULTIPLE LAYERED THERMOPLASTIC PIPE

Granville J. Hahn; Raleigh N. Rutledge, and Jackie D. Murley, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed May 12, 1983, Ser. No. 493,907
Int. Cl.³ B29D *23/04*
U.S. Cl. 425—133.1 **7 Claims**

1. A balanced flow die apparatus for producing multilayer thermoplastic pipe, the apparatus comprising:

a hollow die body having a bore extending therethrough;

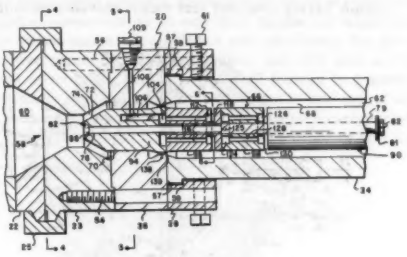
a mandrel located in the bore in said die body forming an annular extrusion passageway with said body and having a coextrusion passageway extending therethrough, said extrusion and coextrusion passageways having a common inlet for receiving a first thermoplastic material and having a common outlet;

spider means extending across said extrusion passageway locating said mandrel in said body;

flow restriction means in said extrusion passageway downstream of said spider means for reuniting said thermoplastic material in said extrusion passageway that has been disrupted by said spider means;

flow restriction means in said coextrusion passageway for balancing the flow rates in said extrusion and coextrusion passageways; and,

passageway means in said body and mandrel forming an annular feed chamber and for carrying a second thermo-



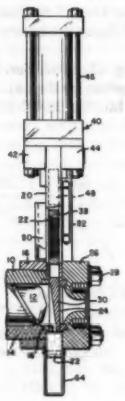
plastic material to an annular radial orifice in said mandrel, said annular orifice being located downstream of said spider means and restriction means and connected to said extrusion passageway whereby said second thermoplastic material is interposed between said first thermoplastic material in said extrusion and coextrusion passageways to form a multilayer pipe having at least two thermoplastic materials located in concentric juxtaposition.

4,507,072

DIVERTING PLATE

Milton U. Gaul, Jr., Hockessin, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Oct. 25, 1982, Ser. No. 436,455
Int. Cl.³ B29F *3/06*
U.S. Cl. 425—185 **3 Claims**



3. In an installation including an extruder, a flow line leading from the extruder, a strainer in the flow line and an associated apparatus of the cartridge type for changing strainers, the improvement comprising provision of an otherwise solid plate having a passage therethrough for diverting extrudate from the line, said plate having the same external dimensions as and being adapted for use in place of either a strainer or another plate, said plate having a cavity in one surface and a port leading from the cavity to the side of the plate, said cavity

being tapered from a maximum depth adjacent said port to its shallowest depth opposite said port.

4,507,073

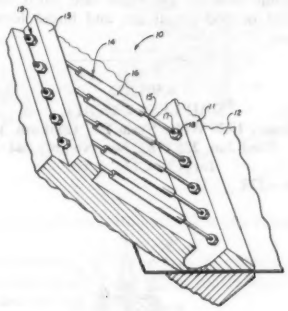
WEB MANUFACTURING APPARATUS

John J. Shelton, Tuttle, Okla., assignor to Fife Corporation, Oklahoma City, Okla.

Filed Feb. 15, 1984, Ser. No. 580,345

Int. Cl.³ B29C *1/00*; B29F *3/04*

U.S. Cl. 425—466 **18 Claims**



1. In a web manufacturing machine including an elongated shaping member engaging material from which the web is formed to adjust the thickness of said material along the length of the shaping member, a support extending parallel to the shaping member, and a plurality of thermal expansion rods mounted on the support and extending to the shaping member to position portions of the shaping member via flexing of the shaping member, the improvement wherein one end of each expansion rod is fixed to the shaping member; wherein a plurality of threaded bores having diameters larger than the diameters of the expansion rods are formed through the support to receive the other ends of the expansion rods, whereby each expansion rod extends from one side of the support; and wherein each expansion rod is connected to the support via a mechanism for axially positioning each rod without backlash, comprising:

a driven screw and an adjusting screw disposed in tandem in the support bore and each of the driven and adjusting screws having external threads to mate with the threads of the support bore, the driven screw positioned adjacent the side of the support from which said rod extends and having an axial bore therethrough threaded on a pitch differing from the pitch of the external threads thereon, and the adjusting screw having a threaded, axial bore formed therethrough; and

a jam screw screwed into the adjusting screw bore; wherein means are formed on facing ends of the driven and adjusting screws for rotatively coupling the driven screw to the adjusting screw; and wherein a portion of said rod near the end thereof adjacent the support is threaded to mate with the threads in the driven screw bore, said portion of said rod being screwed into the driven screw bore.

4,507,074

FLOW CONTROL MODULE AND METHOD FOR LIQUID FUEL BURNERS AND LIQUID ATOMIZERS

Robert L. Babington, and Robert S. Babington, both of McLean, Va., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 17, 1983, Ser. No. 476,292

Int. Cl.³ F23H *1/00*

U.S. Cl. 431—12 **37 Claims**

1. Apparatus for controlling the flow of liquid to a liquid atomizer, comprising:

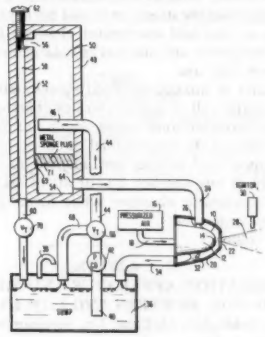
a source of liquid;

an enclosed volume adapted to be positioned above the liquid atomizer;

first conduit means for delivering a first flow of liquid from said source into said enclosed volume at a position for enhancing separation of entrained gases from said liquid;

means, positioned in said enclosed volume below the point of entrance of said first flow, for damping flow pulsations in at least a portion of said first flow from said means for delivering;

second conduit means for receiving a second flow of liquid, not exceeding the magnitude of said first flow, from said enclosed volume at a location below said means for damping near the lower end of said enclosed volume and for



feeding said second flow to the liquid atomizer, said second conduit means being open to ambient pressure at the location of the liquid atomizer for draining said enclosed volume through said second conduit means when said first flow ceases and for permitting the initial flow of liquid through said second conduit means to flush air therefrom, after which said second flow increases as said enclosed volume fills; and

means for sucking a third flow of liquid from said enclosed volume at a location near the upper end thereof when the level of liquid in said enclosed volume reaches said means for sucking, at which time said third flow commences and reduces said second flow.

4,507,075

COMBUSTION DEVICE

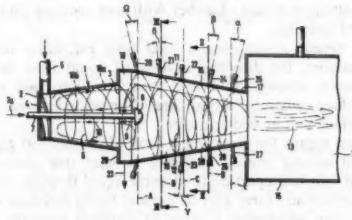
Dietrich Buss, Eschweiler; Klaus Brücher, and Wilhelm Wenz, both of Hückelhoven, all of Fed. Rep. of Germany, assignors to Gewerkschaft Sophia-Jacoba, Hückelhoven, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,483

Claims priority, application European Pat. Off., Dec. 13, 1983, 83112521.6

Int. Cl.³ F23D *15/02*

U.S. Cl. 431—115 **5 Claims**



1. A combustion device, comprising:

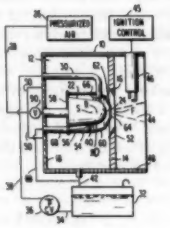
a burner tube having a front end and a back end;
a blow lance which extends axially through said burner tube for supplying fuel thereto out of a discharge end of said blow lance located remote from said front end of said burner tube;
twist means disposed at said front end of said burner tube for imparting a twist to combustion air;
a cap-like part disposed at said discharge end of said blow lance for reversing, outside of the latter, the direction of flow of said fuel;
an accelerator chamber which communicates with said back end of said burner tube and is disposed in the axial direction of the latter; said accelerator chamber is provided with an outer wall having a diameter at the transition from said burner tube to said accelerator chamber which is greater than the diameter of said burner tube at this transition, so that said accelerator chamber has a shoulder at said transition, and also has an enlargement relative to said burner tube; and
a plurality of nozzles disposed substantially tangentially in said outer wall of said accelerator chamber and in a plurality of cross-sectional plane which are disposed one after the other in the longitudinal direction of said accelerator chamber; said nozzles are adapted to supply, independently of one another, gas or air to said enlargement of said accelerator chamber while forming a twist flow in said enlargement.

4,507,076

ATOMIZATION APPARATUS AND METHOD FOR LIQUID FUEL BURNERS AND LIQUID ATOMIZERS

Robert S. Babington, McLean, Va., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 17, 1983, Ser. No. 476,454
Int. Cl.³ F23D *11/28*
U.S. Cl. 431—117 **49 Claims**



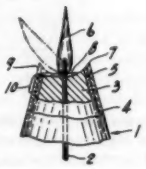
1. Apparatus for atomizing a liquid, comprising:
an atomizing chamber having a wall with a first opening;
a first source of liquid;
a second source of pressurized gas;
a third source of pressurized gas at a pressure lower than that of said second source;
at least one enclosed plenum having a smooth, convex exterior surface with an aperture opening from said at least one plenum through said surface, said plenum being positioned in said chamber with said aperture facing said first opening;
first means, comprising a feed tube extending into said chamber, for directing a flow of liquid from said first source, through said feed tube and onto said exterior surface, whereby a thin film of liquid is formed on said surface and at said aperture;
second means for directing a flow of pressurized gas from said second source into said at least one plenum and through said aperture to atomize liquid flowing over said aperture and form a jet of gas and liquid droplets, said jet thereby producing a zone of reduced pressure downstream of said aperture;
third means for directing a flow of gas from said third source into said atomizing chamber; and shield means within said atomizing chamber and at least partially surrounding said at least one plenum for protecting said thin film from ambient gas currents in said atomizing chamber, said feed tube extending through said shield means, said shield means being spaced from said exterior surface for permitting free flow of said thin film over said surface and said shield means comprising a second opening downstream of and axially aligned with said aperture and said first opening, through which second opening gas and atomized liquid can flow, said second opening of said shield means being spaced from said aperture at a distance for facilitating flow of gas from said third source to be entrained in said jet of gas and liquid formed at said aperture.

4,507,077

DRIPLESS CANDLE

John M. Sapper, 1720 White Swan Dr., Oshkosh, Wis. 54901

Filed Jan. 25, 1982, Ser. No. 342,244
Int. Cl.³ C11C *5/00*
U.S. Cl. 431—228 **13 Claims**



1. A non-drip candle comprising an inner core of candle wax having a wick extending through said core, an intermediate bonding layer on said core and substantially coextensive with said core, said intermediate bonding layer being a thin layer substantially less than said core and including a high flame retardant material and a lesser flame retardant material and wax, and an outer high melt layer on said intermediate bonding layer and substantially coextensive with said intermediate bonding layer, said high melt layer being a thin layer on the order of said intermediate layer and having a composition different from said intermediate layer and a melting point significantly greater than said core, said intermediate layer and said outer layer defining a thickness substantially less then said core, and said high flame retardant material essentially isolating a wax pool on the core about the wick from said outer layer and thereby a breach in said outer layer reheals as the candle burns.

4,507,078

WAFER HANDLING APPARATUS AND METHOD

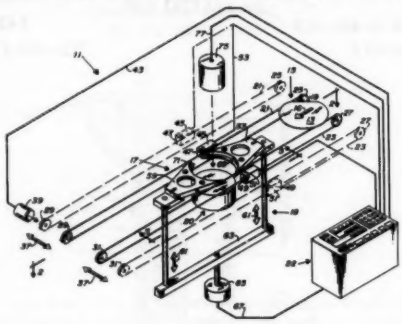
Johann Tam, Saratoga; Jalal Ashjaee, Mountain View; Nobuo B. Kuwaki, San Jose; Tuan M. Ngo, Milpitas, and Susan W. Kung, Oakland, all of Calif., assignors to Silicon Valley Group, Inc., San Jose, Calif.

Filed Mar. 28, 1983, Ser. No. 479,197
Int. Cl.³ F27D *3/00*; F27B *9/14*; B65G *43/00, 15/00*
U.S. Cl. 432—11 **26 Claims**

1. A method of heating a silicon wafer at varied rates of heating for a processing step of the kind in which it is necessary to bake off a solvent used in applying a photo resist to the wafer or to bake off a liquid used in washing or cleaning the wafer, said method comprising,
maintaining a hot plate having a relatively large mass in comparison to the mass of the wafer at a substantially constant temperature level which is higher than the equilibrium or bake out temperature level to which the wafer is to be heated,
positioning the wafer in close proximity to the hot plate at

the beginning of the heating cycle to produce an initial rate of heating of the wafer,

repositioning the wafer relative to the hot plate at any one of a wide range of selectable distances to vary the thickness of an air gap between the wafer and the hot plate and to



change the rate of heating of the wafer from said initial rate,

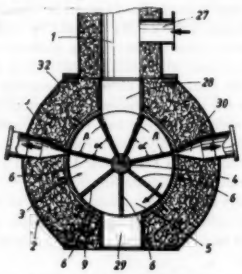
heating of the wafer as a function of the distance of the wafer from the hot plate by controlling the distance between the wafer and the hot plate.

4,507,079

APPARATUS FOR DISCHARGING SOLIDS FROM A SHAFT FURNACE

Martin Nagl, Rutzenmoos, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 10, 1983, Ser. No. 493,204
Claims priority, application Austria, May 18, 1982, 1958/82
Int. Cl.³ F27B *21/00*
U.S. Cl. 432—95 **6 Claims**



1. An apparatus for discharging solids from a shaft furnace which contains a compressed furnace gas, comprising

a lock chamber structure having a peripheral wall formed with an inlet and an outlet peripherally spaced from said inlet,

a rotor mounted in the interior of said lock chamber structure for rotation about a predetermined axis centered with respect to said peripheral wall, said rotor being arranged to seal said inlet from said outlet,

drive means for rotation said rotor about said axis, and

a conveyor duct connected to said inlet and adapted to be connected to said shaft furnace and to transfer solids from said shaft furnace to said inlet,

the improvement residing in that

said rotor consists of a cellular wheel having a plurality of cell-defining radial walls regularly angularly spaced apart and defining successive conveying portions for conveying said solids from said inlet to said outlet during a rotation of said cellular wheel,

a source of a compressed blocking gas communicates with said conveyor duct,

an exhaust gas duct communicates with the interior of said lock chamber structure through said peripheral wall adjacent to said conveying portions between said inlet and said outlet, the exhaust gas duct being spaced from said inlet and from said outlet by an angle which exceeds the angular spacing of two adjacent ones of said radial walls,

said drive means comprises a shaft non-rotatably connected to said rotor and two bearings disposed at opposite ends of said lock chamber structure and rotatably supporting said shaft,

said lock chamber structure and said shaft define between them at least one annular passage between each of said bearings and said cellular wheel, and

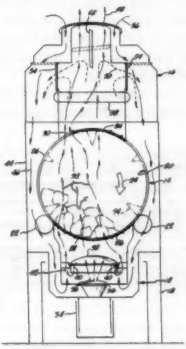
means is provided for passing a cooling fluid through said annular passage.

4,507,080

LAUNDRY DRYER

Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge Cook Bros., Inc., Industry, Calif.

Filed Jul. 22, 1983, Ser. No. 516,308
Int. Cl.³ F27B *7/36, 7/00;* **F26B** *21/06, 19/00*
U.S. Cl. 432—105 **24 Claims**



1. In a fabric dryer, the combination of; a housing, a perforated drum for the fabric mounted in the housing for rotation on a generally horizontal axis during drying, said housing having means cooperating with said drum for causing the drying air to circulate through said drum from only the central lower portion of the drum in an upwardly direction and at least partially in both axially outward directions to exit from the drum near the axial ends through circumferentially extending slots at each end with no air circulating passage located axially between said slots.

4,507,081

APPARATUS WITH HEAT EXCHANGE MEANS FOR TREATING SOLID, GRANULAR AND AGGREGATE MATERIALS

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 8, 1983, Ser. No. 521,498
Int. Cl.³ F27B *7/36, 15/00*
U.S. Cl. 432—106 **11 Claims**

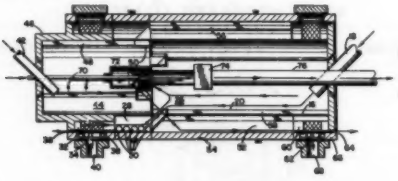
9. An apparatus for treating solid, granular and aggregate materials comprising:

a. first chamber means having inlet means formed adjacent one end thereof and outlet means formed adjacent the other end thereof, said inlet means communicating with the exterior of the apparatus and providing an entrance to said first chamber means for material supplied thereto from the exterior of the apparatus at a first temperature, said first chamber means operating to retain the material

therewithin while the material is being preheated during the course of the passage in a first direction through said first chamber means, said outlet means communicating with the exterior of the apparatus and providing an exit from said first chamber means to the exterior of the apparatus for discharging to the exterior of the apparatus the material following the preheating thereof in said first chamber means to a second temperature greater than said first temperature;

b. second chamber means located in juxtaposed relation to said first chamber means such that the longitudinal axis of said second chamber means and the longitudinal axis of said first chamber means lies in a common plane, said second chamber means having reentry means formed adjacent one end thereof and exit means formed adjacent the other end thereof, said reentry means communicating with the exterior of the apparatus and providing an entrance to said second chamber means for material supplied thereto from the exterior of the apparatus at a third temperature greater than said second temperature, said second chamber means having insulation provided in surrounding relation thereto to effect the retention of heat within said second chamber m ans, said second chamber means being operative to effect a post reclamation of the material supplied thereto from the exterior of the apparatus at said third temperature during the passage of the material through said second chamber means, said exit means providing an exit from said second chamber means for the material following the post reclamation thereof in said second chamber means;

c. third chamber means having entrance means formed adjacent one end thereof and discharge means formed adja-



cent the other end thereof, said entrance means communicating with said exit means of said second chamber means and providing an entrance to said third chamber means for materi·l exiting from said second chamber means, said third chamber means operating to retain the material therewithin while the material undergoes cooling during the course of the passage thereof through said third chamber means to a fourth temperature less than said third temperature, said third chamber means being located in concentric relation to said first chamber means such that material during the passage thereof through said first chamber means is preheated from said first temperature to said second temperature and is cooled during the passage thereof through said third chamber means to said fourth temperature less than said third temperature by virtue of a heat exchange between the material traversing said third chamber means in a second direction and the material traversing said first chamber means in a first direction, said discharge means communicating with the exterior of the apparatus and providing an exit from said third chamber means to the exterior of the apparatus for discharging to the exterior of the apparatus the material following the cooling thereof in said third chamber means to said fourth temperature; and

d. rotating means cooperatively associated with said first chamber means, said second chamber means and said third chamber means, said rotating means being operative to effect the rotation of said second chamber means as the material undergoes post reclamation therewithin, and of said first chamber means and said third chamber means as the material traverses said first chamber means in a first direction and said third chamber means in a second direction.

4,507,082

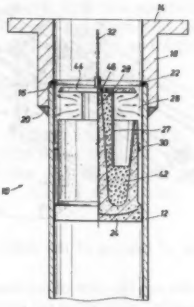
PREHEATING INSERT FOR HEAVY WALL PIPE

Louis J. Wardlaw, III, 15306 Bonita Springs, Houston, Tex. 77083

Continuation-in-part of Ser. No. 236,999, Feb. 23, 1981, abandoned. This application Apr. 8, 1982, Ser. No. 366,555

Int. Cl.[3] F24J 3/00

U.S. Cl. 432—224 7 Claims



1. For use with a pipe to be welded, which pipe is in a surrounding concentric relationship and which requires preheating to an elevated temperature for a specified interval, a preheating apparatus comprising:

(a) a supporting cylindrical casting sized to fit within a pipe to be preheated, said cylindrical casting including a bottom portion and defining a cavity;

(b) a combustible solid fuel mixture supported in said casting and having a generally cylindrical elongate outer surface conforming to the cavity defined by said cylindrical casting, said mixture further being made of a material which burns at a controlled temperature for a specified interval to liberate heat in the form of upwardly flowing gases;

(c) a deflector plate positioned above and spaced from said casting defining a gap therebetween, said deflector plate extending outwardly and arranged concentrically within the pipe to deflect the upward flow of heated gases radially toward the surrounding pipe;

(d) integrally cast chain means adapted to support and position said cylindrical casting in the pipe; and

(e) wherein said cylindrical casting is formed of a frangible material.

7. For use with a pipe to be welded, which pipe is in a surrounding concentric relationship and which requires preheating to an elevated temperature for a specified interval, a preheating apparatus comprising:

(a) a supporting casting sized to fit within a pipe to be preheated, said casting including a bottom portion;

(b) a combustible solid fuel mixture supported on said bottom portion and having a generally cylindrical elongate shape, said mixture further being made of a material which burns at a controlled temperature for a specified interval to liberate heat in the form of radially flowing gases;

(c) a deflector plate positioned above said bottom portion, said deflector plate extending outwardly and arranged concentrically within the pipe to deflect the upward flow of heated gases radially toward the surround pipe;

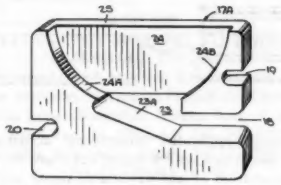
(d) integrally cast chain means adapted to support and position said supporting casting in the pipe; and

(e) wherein said bottom portion and said deflector plate are separated by a solid upstanding neck integrally formed with said bottom portion and extending through said solid fuel mixture supported on said bottom portion.

4,507,083
GAS-FIRED INFRARED PROJECTION HEATER

Joseph Fraioli, 8 Seymour Pl., White Plains, N.Y. 10605

Continuation-in-part of Ser. No. 420,927, Sep. 21, 1982, Pat. No. 4,432,727. This application Jan. 9, 1984, Ser. No. 569,022
The portion of the term of this patent subsequent to Feb. 21, 2000, has been disclaimed.
Int. Cl.³ F23D 23/00
U.S. Cl. 432—227 8 Claims



1. A gas-fired infrared heater for projecting a directional infrared radiation pattern for irradiating the surface of a product to effect substantially uniform heating thereof, said heater comprising:

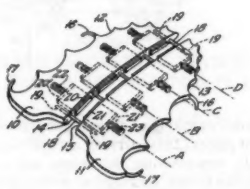
A a gas-fired burner constituted by an elongated premixing casing supplied with air and gas, said casing having a longitudinal slot from which is projected an outlet having a first set of corrugated ribbons adjacent its front end, whereby emitted therefrom is a sheet of flame; and

B a refractory body of a material radiating infrared energy when heated to an elevated temperature level having a longitudinal socket to receive the outlet of said burner, an internal cavity having a surface onto which the burner flame impinges to be heated thereby to a temperature level causing it to emit infrared radiation, and openings communicating with said cavity to define radiation horns to produce said directional infrared radiation pattern, the cavity surface onto which said flame impinges being inclined relative to burner outlet at an angle at which no infrared energy from this surface is directed toward said outlet.

4,507,084
PALATAL EXPANSION DEVICE

Abraham Blechman, Tappan, N.Y., and Eugene A. Pescatore, Elmwood Park, N.J., assignors to Medical Magnetics, Inc., Ramsey, N.J.

Filed Dec. 13, 1983, Ser. No. 560,878
Int. Cl.³ A61C 7/00
U.S. Cl. 433—7 13 Claims

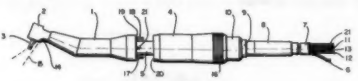


1. An orthodontic device for rapid palatal expansion of a maxillary arch, comprising two palate body parts constituting right and left longitudinally divided halves of a body, said body parts having adjacent longitudinally extending central confronting edges and having outer edges in general conformance with the lingual contouring of teeth of the respective right and left halves of a maxillary arch, guide means including aligned coacting formations in said adjacent edges of the respective body parts, said guide means establishing a degree of relative lateral displaceability of said body parts with respect to each other, and means including a polarized magnet carried by each of said body parts, said magnets being in like-pole confronting relation, whereby repulsion-force reaction between said magnets is operative to constantly urge outward lateral displacement of said body parts.

4,507,085
DENTAL INSTRUMENT WITH HANDPIECE

David Mosimann, Bienne; Theodor Walther, Lengnau b. Biel, and Jean-Pierre Schnider, Bienne, all of Switzerland, assignors to Bien-Air, Switzerland

PCT No. PCT/CH81/00019, § 371 Date Oct. 19, 1981, § 102(e) Date Oct. 19, 1981, PCT Pub. No. WO81/02249, PCT Pub. Date Aug. 20, 1981
Continuation of Ser. No. 314,063, Oct. 19, 1981,. This PCT application Feb. 18, 1981, Ser. No. 569,941
Claims priority, application European Pat. Off., Feb. 18, 1980, 80810060.6
Int. Cl.³ A61C 1/08
U.S. Cl. 433—126 16 Claims



1. A dental instrument with a handpiece having a fore end and a rear end, comprising:

at least one axially protruding portion located at the rear end of the handpiece;

a tool carrying head being removably mounted at the fore end of the handpiece;

an intermediate section having a fore end and a rear end, the intermediate section containing a micromotor for driving a tool carried by the head of the handpiece, the fore end of the intermediate section having complementary hole portions, equal in number to said at least one axially protruding portion, for receiving the axially protruding portions on the rear end of the handpiece, thereby non-rotatably fixing the rear end of the handpiece with the fore end of the intermediate section;

a female portion of an adapter having a fore end and a rear end, the fore end of the female portion is fixed to the rear end of the intermediate section;

a male portion of an adapter having a fore end and a rear end, the fore end of the male portion is rotatably mounted to the rear end of the female portion of the adapter; and

a flexible sheath fixed to the rear end of the male portion of the adapter, the flexible sheath containing at least one supply source for the driving tool and the micromotor, the supply sources extending through said male and female portions.

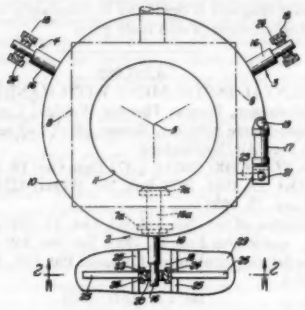
4,507,086
TURRET SHAKER MECHANISM

Henry A. Borg, Romeo, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 18, 1984, Ser. No. 611,572
Int. Cl.³ G09B 9/04
U.S. Cl. 434—29 13 Claims

1. A turret motion simulator comprising a platform on which the turret is to be mounted; three platform support structures spaced equidistantly around the circumference of the platform; each support structure comprising a ball-socket means having a transverse opening extending through the ball center, a shaft extending from the platform through the opening in the ball, and power means for oscillating the ball-socket means in a vertical direction; the three power means being selectively actuatable whereby the platform can undergo vertical and/or

tilting motions; each shaft being oriented to the associated ball-socket means such that the shaft can slide on the ball in the



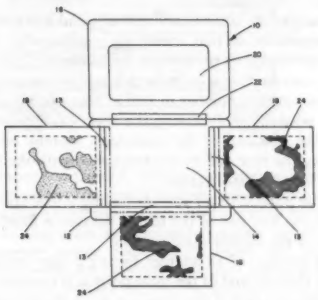
direction of its length, and the ball can swivel in the socket about the ball center.

4,507,087

CLOSED FINGER PAINTING DEVICE

Rosemary C. Stevenson, Buies Creek, N.C., assignor to Inventions International Incorporated, Coats, N.C.

Filed Aug. 23, 1984, Ser. No. 643,473
Int. Cl.[3] G09B *23/22*
U.S. Cl. 434—98 **10 Claims**



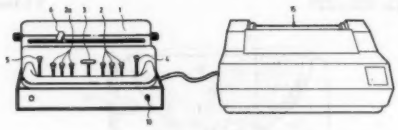
1. A hand and finger manipulative device for creating different colors and designs that is both entertaining and educational, comprising: a closed hand and finger painting means for presenting a hand and finger manipulative closed painting system of overlapping and individually packed colored fluids that can be manipulated by hand and finger to create a wide variety of designs, said closed hand and finger painting means including a base structure having a perimeter area and an interior area defined inwardly of the perimeter area; a plurality of closed, clear, flexible bag-like containers secured to said base structure so that said flexible containers assume a normal overlapped position with one flexible container lying over another and a plurality of different colorful, transparent, viscous fluids each of which is enclosed within one of said flexible bag-like containers such that said fluids give an optical impression of being mixed when said containers assume said normal overlapped position where said fluids lie one over another such that said fluids can be pressed, squeezed and otherwise manipulated by hand and finger within the respective bag-like containers to create different color combinations in an infinite variety of distinctive and colorful designs.

4,507,088

DECIPHERING APPARATUS

Norman Wilson, 58 Webb St., Stafford, Qld. 4053, Australia

Filed Sep. 6, 1983, Ser. No. 529,606
Claims priority, application Australia, Sep. 8, 1982, PF5791
Int. Cl.[3] G09B *21/00*
U.S. Cl. 434—112 **7 Claims**



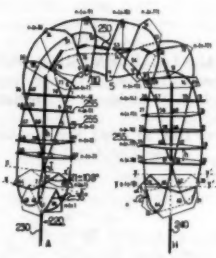
1. Deciphering apparatus comprising actuating means adapted to be associated with a coded keyboard for providing signals upon operation of said keyboard, signal interpretation means associated with said actuating means and connectable to reproduction apparatus to cause said reproduction apparatus to provide a decipherable output therefrom responsive to said signal; said actuating means comprising a plurality of mechanical links mounted on a support housing having support means thereon for supporting a braille typing machine, and said mechanical links cooperating with the respective keys of said keyboard of said braille typing machine for operation thereby; and said mechanical links include a plurality of push rods biased to an extended position to engage operatively with the respective said keys.

4,507,089

MECHANICAL SUPPORT MODULE FOR NUCLEIC ACID

Germain Tchuempe-Tchuente, 11 Square du Docteur Guérin, 35000 Rennes, France

Filed Mar. 23, 1984, Ser. No. 592,931
Claims priority, application France, Mar. 24, 1983, 83-05294
Int. Cl.[3] G09B *23/26*
U.S. Cl. 434—279 **18 Claims**



1. A module consisting of at least one frame (**110**) supporting a plurality of plates (**255**) carrying accessories which are in the form of balls representing the atoms and sticks or the like representing the bonds, arranged so as to reproduce purine and pyrimidine bases of nucleic acids, wherein each of these plates (**255**) incorporates the representation of four puropyrimidine bases chosen from the puropyrimidine bases (A.T.G.C.U.), namely adenine, thymine, guanine, cytosine and uracil, and from the special hydrogenated or methylated bases ψ, U^{om}, G^{m}, G^{om}, C^{om}, I^{m}, I, G^{m}, C^{m}, A^{m} etc. (pseudo-uridylic acid, 2'-O-methyluridylic acid, N(2)-dimethylguanylic acid, 2'-O-methylcytidylic acid, 1-methylinosinic acid, inosinic acid, 1-methylguanylic acid, 5-methylcytidylic acid, 6-methyladenylic acid etc.), depending on the nucleic acid in question, these plates (**255**) being orientated and held in position in space, relative to one another, by support means firmly fixed to the

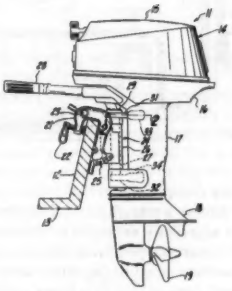
frame (110) so that, on the one hand, the physical representation (M) of the hydrogen bonding orbitals of partial coordination number between the pairs of purine and pyrimidine bases constitutes a first Moebius strip, called a local Moebius strip, and so that, on the other hand, the physical representation (T) of the pathway followed by the genetic biochemical information from one base to the next and from one plate to the next constitutes a second Moebius strip, called a global Moebius strip or polymoebius strip.

4,507,090

PROPELLING UNIT SUPPORT STRUCTURE FOR OUTBOARD ENGINES

Hidetaka Kobayashi, and Akiyoshi Kinpara, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Jan. 25, 1982, Ser. No. 342,221
Claims priority, application Japan, Jan. 27, 1981, 56-11169
Int. Cl.³ B63H *21/30*
U.S. Cl. 440—52 **15 Claims**



1. An arrangement for suspending an outboard propelling unit upon the hull of a boat and for dampening vibrations associated therewith comprising a drive unit and means for mounting said drive unit upon said hull for steering movement about a generally vertically extending axis including first resilient means and second resilient means interposed between said drive unit and said hull, said first resilient means having a substantially lower rate than said second resilient means, and means for loading said resilient means upon relative movement of the said drive unit and said hull wherein said first resilient means causes dampening only upon small magnitude relative movements and wherein said second resilient means causes dampening upon large relative movements.

4,507,091

PROPELLER PROTECTING DEVICES

Donald T. Govan, P.O. Box 3277 Bahia Mar, Ft. Lauderdale, Fla. 33316

Filed Apr. 4, 1983, Ser. No. 481,774
Int. Cl.³ B63H *5/16*
U.S. Cl. 440—73 **9 Claims**

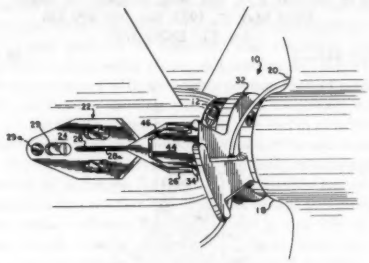
1. An apparatus designed to cut lines or nets of the type that may befoul the running gear of propeller driven, sea-going vessels, comprising,

a first cutting blade means including a single cutting blade member mounted in non-rotatable relation to a rotatable propeller shaft means,

a second cutting blade means including a pair of diametrically opposed, rotatably mounted blade members disposed in line or net shearing relation to said first cutting blade means, attendant rotation thereof,

said non-rotatable blade member and said rotatable blade members provided with ramp-like portions on the respective distal ends thereof,

said ramp-like portions projecting outwardly in the plane of rotation of said rotatable blades, from a main body portion of each of said respective blade members so that the respective main body portions of such blades will cooperate with one another to achieve a shearing action in the absence of jamming, even when such blades are worn.

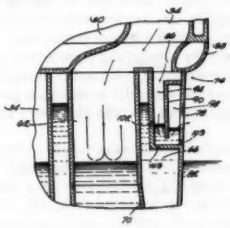


4,507,092

IDLE EXHAUST FOR MARINE PROPULSION SYSTEMS

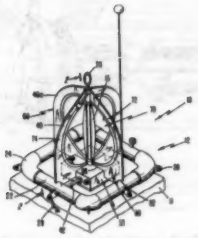
Charles B. Hall, Ingleside, and Martin J. Mondek, Wonder Lake, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 15, 1983, Ser. No. 504,626
Int. Cl.³ B63H *21/26*
U.S. Cl. 440—89 **9 Claims**



1. A marine propulsion device comprising a propulsion unit including an internal combustion engine including an exhaust gas outlet, and a lower unit including a gear box, a drive shaft housing rigidly connected to and located between said gear box and said engine and including an exhaust gas relief outlet communicating with the atmosphere, a propeller rotatably supported in said gear box, an exhaust gas discharge outlet in said lower unit and intended to be submerged in water when said engine is operating at low speed, an exhaust gas duct extending from said engine exhaust gas outlet to said discharge outlet and including a portion extending downwardly in said drive shaft housing from the top thereof, and an exhaust relief passageway extending from said engine exhaust gas outlet to said exhaust relief outlet and including a portion extending downwardly in said drive shaft housing from the top thereof and in spaced relation to said portion of said exhaust gas duct in said drive shaft housing and communicating with said engine exhaust gas outlet independently of said portion of said exhaust gas duct in said drive shaft housing.

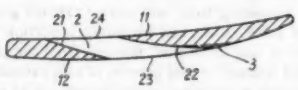
4,507,093
BUOY DEVICE FOR AUTOMATIC RAISING OF SUBMERGED OBJECTS
James H. Norvell, P.O. Box 3086, Juneau, Ak. 99803
Filed May 31, 1983, Ser. No. 499,335
Int. Cl.[3] B63G *8/22*
U.S. Cl. 441—2 16 Claims



1. A submergible device for raising a load such as a fish trap, crayfish pot and the like to the surface of the water, comprising:
(a) a tank for containing gas under pressure;
(b) frame means establishing a volumetric chamber region in said device connected for receiving pressurized gas from the tank so that pressurized gas expanding into the chamber causes the device to ascend to the water surface with the load;
(c) control valve means for controlling gas flow between the tank and chamber, wherein said control valve means is contained within a housing;
(d) means for connecting the frame means to the housing, said connecting means including a sleeve like member having one end received in the housing and an opposite end connected to the frame means, said sleeve like member having a passage permitting gas to pass from the control valve means to the chamber region; and
(e) means for releasably attaching the device to the load.

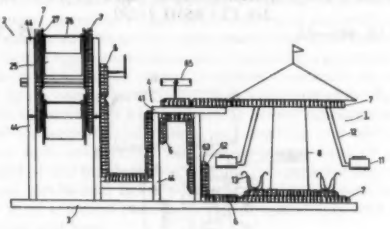
13. A submergible device for automatically raising submerged objects to a water surface, comprising:
(a) supply means for containing pressurized gas;
(b) means having a buoyancy chamber connected for receiving pressurized gas from the pressurized gas supply means so that gas expanding into the chamber causes the device to ascend;
(c) valve means connected to the supply means for admitting gas under pressure into said chamber; and
(d) means for coupling said device to a lifting means to enable the device to be lifted from the water after said device ascends to the surface, said coupling means including a normally closed deflation valve means operable to automatically open and thereby cause rapid exhaustion of gas from the chamber when a lifting force is applied to the coupling means.

4,507,094
BOARD FOR AQUATIC SPORTS
Georges B. Hennebutte, 43, Avenue Foch, Biarritz, France (64200)
Filed Aug. 9, 1982, Ser. No. 406,620
Int. Cl.[3] B63B *35/72*
U.S. Cl. 441—65 2 Claims



1. A board for aquatic sports, comprising a board for supporting a person in water and means for directing, during displacement of the board through the water, a substantial jet of water against a substantial portion of the abdominal region of a person lying on the board, said means comprising a duct extending obliquely through the thickness of the board, the duct having a lower opening and an upper opening, the lower opening having a larger area than the upper opening, and the duct having a forward duct surface and an after duct surface, each duct surface being curved so as to be concave forward.

4,507,095
MODULAR TOY WHIRLING UNIT
Weng-Pin Lin, 30. Chien-Yung St., Taichung, Taiwan
Filed Sep. 28, 1982, Ser. No. 426,126
Int. Cl.[3] A63H *33/08*
U.S. Cl. 446—118 3 Claims



1. A modular toy comprising:
a base member having a plurality of uniformly spaced circular first holes adjacently arranged in intersecting rows;
support rods of square-shaped cross section having the side of said cross section equal to the center-to-center distance of two adjacent ones of said first holes, each of said rods including at least one end face hole and a row of uniformly spaced second adjacent holes equal in size to said first holes;
cylindrical peg members adapted to fit into said first end face and second holes for coupling said base member and said support rods and for connecting adjacent support rods so as to form into a support frame;
circular members of different diameters but the same thickness, said thickness being equal to the diameter of said first holes, each of said circular members having both bevel and spur gearing teeth and having an opening at the center thereof, the radius thereof being integral multiples of the center-to-center distance of said first holes;
means for movably and detachably mounting said circular members on said base member and on said support rods, said means capable of being fitted into said first and second holes and said openings, whereby said circular members can be interchangeably mounted on said base member and said support rods for rotation about axes both horizontal and vertical to said base member, upon mounting said circular members are serially interengaged to permit simultaneous rotation as soon as one of said circular members is driven.

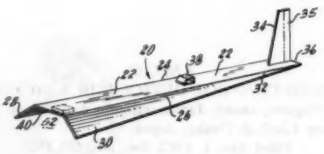
4,507,096
GROUND EFFECT TOY
Richard M. Greenfield, Jr., 9750 SW. 158th St., Miami, Fla. 33257
Filed Apr. 15, 1983, Ser. No. 485,267
Int. Cl.[3] A63H *29/10, 27/00*
U.S. Cl. 446—176 7 Claims

1. A ground effect toy for low frictional movement in proximity to a substantially smooth surface comprising:
a rectangular top member having leading, trailing, and side elongated edges, and having a substantially planar under-

side that forms an acute angle with the surface at the trailing edge when the toy is at rest on the surface;

two acute triangular side skirts depending downwardly from the side elongated edges of said top member, said side skirts having elongated edges which are continuously adjacent the side elongated edges of the top member and having leading edges in transverse proximity to the leading edge of the top member;

said triangular side skirts having their leading edges as the base of the triangles and said side skirts tapering rearwardly to form peaks of the triangles in transverse proximity to the trailing edge of the top member;



said rearwardly tapering side skirts and said planar rectangular top member forming, when the toy is in movement across a smooth surface, an air compressing and trapping cavity between said toy and said smooth surface, whereby said trapped air will cause a supporting lift on said toy as long as forward movement of said toy is maintained;

means to maintain a leading edge of the toy in proximity to the surface during movement thereof; and

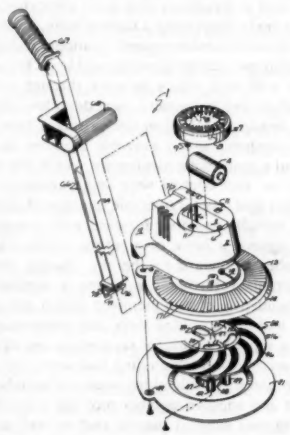
means attached to the toy to orient a leading edge thereof forwardly during movement.

4,507,097

TOY ASSEMBLY

Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.

Filed Dec. 15, 1982, Ser. No. 450,019
Int. Cl.³ A63H *1/00*
U.S. Cl. 446—236 **4 Claims**



1. A toy comprising a housing member; a motor mounted on said housing member having a drive shaft extending therefrom; vane member means connected to said drive shaft to be driven thereby, at least a portion of said vane member means being disposed relative said housing to extend beyond the periphery thereof so as to be visible relative thereto; electric power means to drive said motor mounted on said housing member; an electrical circuit connecting said power means to said motor, said circuit including switching means comprising a first switch member mounted on said housing, normally biased to open position and adapted to be moved against said bias, when said toy is placed into pressing contact with an opposing surface, to closed position to complete said electrical circuit whereby said vane member means mounted on said drive shaft of said motor is driven with the visible portion thereof creating a visually decorative moving pattern, said switching means including a flexible arm member split at one end in at least two parts, one of which parts is pivotally mounted to said housing and the other of which is arranged to resiliently engage against said housing; an actuating button fixed to the other end of said arm member; a first contact member fixed to said arm member, said first contact member being connected to one side of said electrical circuit which connects said power means to said motor; a second contact member fixed to said housing, said second contact member being connected to a second side of said electrical circuit and being so positioned to engage with said first contact member when said actuating button on said arm member is pressed into contact with an opposing surface to close said circuit, said contacts being caused to separate by said resiliently engaging part of said arm member which biases said contacts to "open" position when the pressure on said actuating button against the opposed surface is released.

4,507,098

SKATING DOLL WITH LEGS HAVING ANGLED PIVOT AXES

Rouben T. Terzian, Chicago, and Horst-Dieter Herbstler, Bolingbrook, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 22, 1982, Ser. No. 443,484
Int. Cl.³ A63H *11/00*
U.S. Cl. 446—288 **17 Claims**

1. A self-powered skating doll comprising:

a body;

a drive means including a motor contained within said body;

a pair of legs pivotally mounted on said body, each arranged to pivot relative to said body about a fixed axis arranged to be non-parallel with and to dorsally intersect the axis of pivotal movement of the other leg;

each of said legs including a foot supported atop a skate adapted for preferential movement in contact with a supporting surface along a line generally perpendicular to the axis of pivotal movement of the leg to which it is not attached;

said drive means pivoting said legs about their axes in generally opposite directions with respect to one another;

said drive means including a side to side weight shifting mechanism; and

a head pivotally mounted on said body, said mechanism pivoting said head in conjunction with the movement of said legs to place the weight of the doll on the leg which is forwardmost.

4,507,099

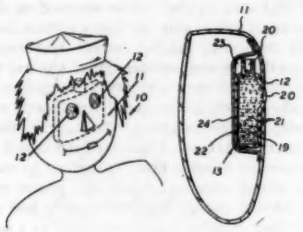
TOY EYE CONSTRUCTION

Benjamin Kinberg, 200 Fifth Ave., New York, N.Y. 10010

Filed Aug. 1, 1983, Ser. No. 519,066

Int. Cl.[3] A63H *3/38*

U.S. Cl. 446—389 3 Claims



1. An improved animated toy having human or animal characteristics having a head portion formed with eye simulated openings, the improvement of an eye construction for use in the head portion, said eye construction comprising a sealed container having a front surface portion contoured to conform to the inner curvature of the head portion, said front surface having a protrusion for simulating an eye curvature, said protrusion being disposed within the eye opening, and said front surface portion being formed of a clear, see-through material, a fluid medium occupying substantially the entire volume of said container, said fluid medium being sealed within said container, a plurality of small, colored, sparkler type particles dispersed throughout said fluid medium, and said fluid medium having a viscosity sufficient to maintain said particles randomly suspend ed within said fluid medium as the toy is shaken and moved.

4,507,100

UNIVERSAL JOINT HAVING ROLLER TRACKS SUPPORTED BY RESILIENT MEMBERS

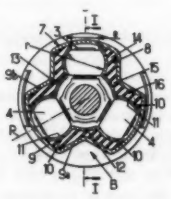
Jacques P. Doré, Colombes, and Bernard G. J. Guerlet, Saint-Mard, both of France, assignors to Automobiles Citroen and Automobiles Peugeot, Paris, France

Continuation of Ser. No. 228,170, Jan. 26, 1981, abandoned. This application Aug. 25, 1983, Ser. No. 526,224

Claims priority, application France, Feb. 12, 1980, 80 03092; Dec. 5, 1980, 80 25947

Int. Cl.[3] F16D *3/20*

U.S. Cl. 464—111 2 Claims



1. A universal joint comprising:

an inner element secured to a first shaft and having a number of evenly spaced-apart journals each carrying a roller, the outer surface of which is at least partly spherical;

an outer element secured to a second shaft and comprising a casing provided with a plurality of housings equal in number to the number of rollers, each housing accommodating one of said rollers, wherein between each pair of adjacent rollers and the corresponding opposite parts of said casing there is firstly an independent floating plate having dual surfaces defining two roller tracks respectively contacting the sides of the two adjacent rollers, and secondly an independent block of resilient material, said block being compressed between said floating plate and said opposite parts of the casing.

4,507,101

SPEED CONTROL DEVICE FOR A BICYCLE

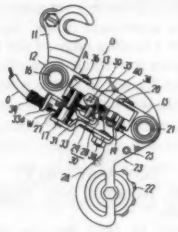
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 1, 1983, Ser. No. 481,452

Claims priority, application Japan, Apr. 7, 1982, 57-57909; Apr. 9, 1982, 57-52316[U]

Int. Cl.[3] F16H *9/00, 7/22*

U.S. Cl. 474—82 12 Claims

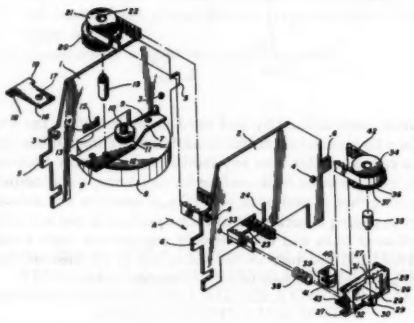


1. A speed control device for a bicycle comprising a speed control lever and a derailleur, said lever comprising a freely rotatable lever body supporting a control wire, a rotary member rotatable against a predetermined rotational resistance, and a first association mechanism allowing said lever body to move in association with said rotary member through a predetermined interval of free movement, said derailleur including a four member linkage mechanism comprising a base member, two linkage members, and a movable member including a chain guide and a positioning mechanism which sets said chain guide in position, said control wire being connected to said derailleur so that said lever is operable to pull said control wire to move said movable member forward with respect to said base member against a force of a return spring biasing said movable member backward to thereby change the bicycle speed, said derailleur further comprising a member, which operates independently of two members which move relative to each other and are provided with said positioning mechanism, and has a support means for supporting one of said control wire and an outer sheath guiding said wire, and a second association mechanism provided between said member having support means and another member movable relative to said member having said support means, said second association mechanism allowing said member having said support means to be movable in a given range with respect to said another member, whereby said movement in a given range can make said return spring inactive and said movable member freely movable in a given range, so that said positioning mechanism is actuated after the movement of said movable member in a given range.

4,507,102
DEVICE FOR MOUNTING THE DEFLECTION ROLLERS OF A RULING MEANS DRIVE

Heinz Geis, Frankfurt; Heinz Lautenschlager, Florstadt; Harmut Schulte, Glauburg, and Siegmund Uliczka, Langen, all of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buround Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,624
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 32107587
Int. Cl.³ F16H 7/08; B41J 19/00
U.S. Cl. 474—101 1 Claim



1. An assembly for mounting first and second shafts rotatably supporting first and second deflection rollers about which a belt is trained and driven comprising,

left and right machine side walls having opposite openings and slots,

a motor having a pinion gear fixed to its shaft,

a shelf extending inwardly from the lower edge of said opening in said left side wall for supporting said motor and said first deflection roller,

said first deflection roller having a gear associated therewith for engagement with said pinion gear,

a shaft for rotatably supporting said first deflection roller,

shouldered means for insertion through said slot in said left side wall above said shelf supported first deflection roller to the extent permitted by engagement of said shoulder and outer left side wall,

means for supporting said shaft below and above said shelf supported deflection roller comprising an opening in said shelf and an opening in said shouldered means,

a guide plate having a guide for insertion into said slot in said right side wall, a cutout and a shelf extending inwardly from the lower edge of said cutout toward the outer side of the right side wall for insertion into said opening in said right side wall for support by the lower edge thereof,

said second deflection roller being supported by said guide plate shelf and being accommodated by said opening in said right side wall and said cutout,

a second shaft for rotatably supporting said second deflection roller,

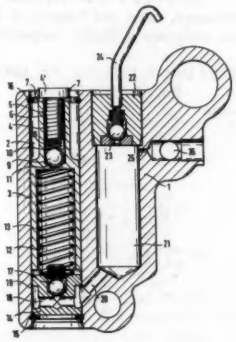
means on said guide plate for supporting said second shaft above and below said deflection roller, and

means for holding said guide plate spaced outwardly from said right side wall to establish tension in a belt trained about said deflection rollers to maintain said deflection roller mounting assembly.

4,507,103
HYDRAULIC CHAIN TENSIONER

Walter Mittermeier, Tamm, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Stuttgart, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,193
Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217632
Int. Cl.³ F16H 7/08
U.S. Cl. 474—110 4 Claims

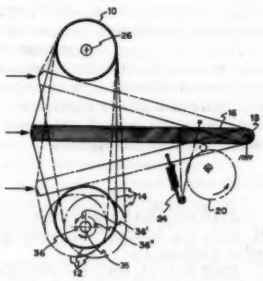


1. A hydraulic chain tightener for internal combustion engines, comprising hollow piston means longitudinally movably guided within a bore of a hydraulic housing and serving for the chain tensioning, said hollow piston means being connected at one end to a pressures space means and including at its opposite end a throttling plug means facing the chain, the air being able to escape out of the hydraulic housing means by way of the throttling plug means, characterized in that an expansion space means is formed between the throttling plug means and the pressure space means, which is adapted to be closed with respect to the pressure space means by a check valve means.

4,507,104
ECCENTRIC PULLEY FOR INELASTIC TIMING BELT

John I. Clark, Milford, and Leo Wologodzew, Huntington, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 31, 1983, Ser. No. 499,660
Int. Cl.³ F16H 7/10
U.S. Cl. 474—112 5 Claims



1. Apparatus for maintaining substantially constant tension in an inelastic timing belt driven by a rigid, swinging arm, comprising:

a driven, circular pulley;

an eccentrically mounted, circular idler pulley;

an inelastic timing belt mounted about said driven and idler pulleys; and

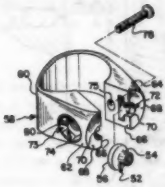
a rigid, swinging arm pivotably mounted equidistant from the centers of the shafts of said driven and idler pulleys and secured at one end to said timing belt, whereby minimum tension is provided to said timing belt at its midmotion and maximum tension is provided to said timing belt at the start and end of its motion.

4,507,105

BICYCLE CHAINGUARD

Richard L. Stottmann, Lima, and Timothy J. Dietz, St. Marys, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio

Filed Dec. 9, 1982, Ser. No. 448,091
Int. Cl.³ F16H *57/02*
U.S. Cl. 474—144 **10 Claims**



1. A chainguard for a bicycle or the like comprising:

a substantially channel-shaped housing for enclosing a length of bicycle chain engaging front and rear sprockets of a bicycle, and having a forward end curved to extend about a front sprocket and a rearward end sized to extend from a front sprocket to a rear sprocket;

means for attaching said rearward end to a bicycle frame adjacent a rear sprocket;

lug means extending sidewardly from said housing and positioned on said forward end to be adjacent a down tube and a seatmast of a bicycle frame to which said chainguard is mounted, said lug means including a shank and a substantially disk-shaped head;

clamp means associated with said lug means for retaining said housing to a bicycle frame, each of said clamp means having a continuous, flexible body with opposing ends, each of said ends having a mating surface and an end face such that, when said body is bent to engage said mating ends, said body forms a loop having an inner contour shaped to conform to a profile of a predetermined portion of an associated bicycle frame;

said mating surfaces and end faces of each of said bodies including a recess such that, when said ends of said body are engaged at said mating surfaces, said recesses form a substantially disk-shaped socket sized to enclose and retain said head with sufficient clearance to permit rotational movement of said lug means relative to said clamp about a central axis of said shank; and

means for joining said ends of said clamp means such that said mating surfaces are engaged.

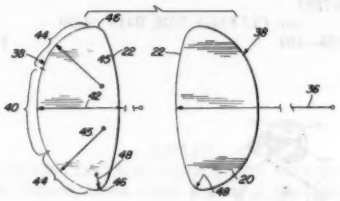
4,507,106

POWER TRANSMISSION CHAIN

Edward H. Cole, Jr., Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 17, 1982, Ser. No. 442,386
Int. Cl.³ F16G *13/04*
U.S. Cl. 474—215 **13 Claims**

1. A rocker joint for a chain constructed of an assembly of links and pivot members, which chain comprises a plurality of sets of links interleaved with other sets of links, each link having a pair of generally round, spaced apertures each of which is defined by a continuous concave wall, a part of which defines a back wall, one set of apertures of one link set being transversely aligned with one set of apertures of the next adjacent link set which is interleaved therewith to form groups of aligned apertures, a pair of pivot members in each group of aligned apertures to both join the link sets and permit articulation of the chain, each pivot member having a continuous convex front surface and a continuous convex back surface, the front surfaces of each pair opposing and rocking on one another and being defined by a first radius, the back surfaces being defined by a second and third radii both of which are smaller than the first radius, said back surface having other



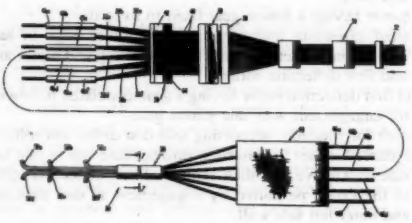
portions each defined by said third radius joined to the front surface by connecting surfaces, each connecting surface having a radius smaller than any radius of the member back surface, each member back surface having a shape substantially matching that of said back wall of said aperture and substantially engaging a back wall of each aperture in one set of the interleaved links and being free of engagement with a back wall of each aperture in the other set of interleaved links through which said pair of pivot members extend.

4,507,107

FILTER MANUFACTURING TECHNIQUE

Richard M. Berger, Midlothian, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 96,538, Nov. 21, 1979,. This application Aug. 25, 1981, Ser. No. 296,122
Int. Cl.³ B31B *23/01;* **B32B** *3/00*
U.S. Cl. 493—44 **37 Claims**



1. A method for the production of a self-sustaining, dimensionally stable, axially elongated smoke filter rod of predetermined cross-sectional size and shape from a continuous filamentary tow of substantially continuous thermoplastic fibers rendered bondable by the application of heat, comprising the steps of:

(a) continuously feeding said tow into the inlet end of an elongated confined zone having throughout its length a substantially uniform cross-sectional size and shape, said confined zone being non-porous along a first portion of its length extending from said inlet end thereof and being porous along a second portion of its length downstream from said first portion;

(b) simultaneously continously feeding gas under pressure into said inlet end of said confined zone in the same general direction as said tow at an angle of about 0°–20° with respect to the longitudinal axis of said confined zone and at a feed rate sufficiently high so as to pneumatically convey said tow through said confined zone in a rod-like

formation substantially conforming to the cross-sectional size and shape of said confined zone and sufficiently low so as to permit escape of at least a major portion of said feeding gas from said confined zone along said porous second portion of its length;

(c) introducing a heated gas into said tow during its passage through said confined zone along a third portion of the length of said confined zone downstream from said porous second portion;

(d) maintaining said tow in contact with said heated gas for a time sufficient to permit said heated gas to contact said tow across substantially its entire cross-section to render said tow bondable;

(e) introducing a coolant gas into said heated tow to bond said tow into a self-sustaining, dimensionally stable, filter rod having said predetermined cross-sectional size and shape; and

(f) continuously withdrawing said filter rod.

4,507,108

DEVICE FOR THE CONTROL OF THE MUTUAL REMOVAL AND APPROCHING MOVEMENT OF LATERAL CONVEYING UNITS IN A CARTON SEALING AND/OR CLOSING MACHINE

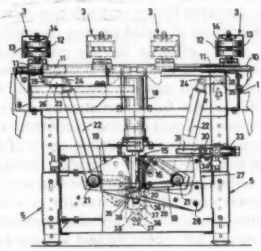
Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Nov. 16, 1982, Ser. No. 442,031

Claims priority, application Italy, Jan. 26, 1982, 19288 A/82

Int. Cl.³ B31B *1/44*

U.S. Cl. 493—167 **8 Claims**



1. Device for the control of the mutual removal and approaching movement of lateral conveying units in a carton sealing and/or closing machine of the kind including a carton support base and, along two opposite sides thereof, a pair of conveying units slidingly mounted on fixed transversal guides of the base so as to be approachable each other to realize a conveying engagement with the carton sides and then movable away from each other for the return to rest position, characterized in that it comprises a rectilinearly sliding plunger with rack-shaped opposite sides, control means of the sliding of said plunger, a pair of rotating sector gears in engagement with said rack sides of said plunger to transform the rectilinear sliding of the same plunger into opposite corresponding rotations of said sector gears, a pair of arms extending from said sector gears up to the proximity of said conveying units and integrally rotating with the same gears, and a pair of connecting rods connected to said arms and said conveying units to transform the rotating movement of said arm into a corresponding translatory motion of said conveying units in opposite senses along said guides.

4,507,109

APPARATUS FOR RECEPTION AND TRANSFER OF SHEET MATERIAL

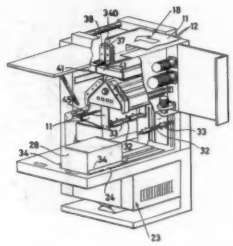
Luciano Meschi, Leghorn, Italy, assignor to Panama, Wully, S.A., Panama

Filed Jan. 29, 1982, Ser. No. 343,820

Claims priority, application Italy, Feb. 2, 1981, 19460 A/81

Int. Cl.³ B65H *45/16*

U.S. Cl. 493—356 **2 Claims**



1. Apparatus for the reception and transfer of sheet material, united as a continuous strip and separable as single sheets by means of prefixed tearing lines, comprising:

means for guiding in accordance with a desired path said continuous strip;

control operated cutting means to carry out the cutting or tearing of the strip correspondingly to a position or prefixed portion of said strip and supporting and piling up means, having a piling up plane movable between a raised position for starting the folded piling up of said strip that comes out of said guiding means and a lowered position, corresponding to the piling up of a prefixed quantity of forms shaped as a continuous strip;

said cutting means including a knife pair operative for cutting the strip passing between the two knives;

said supporting and piling up means including two independent planes, movable between said raised position and lowered position, said planes being alternately fed by said strip that is laid down in a folded configuration; and

a guide assembly including a mechanical deviating member and two symmetrical inclined planes provided upstream of said planes for respectively directing the strip towards one or respectively the other of said planes, and said inclined planes including guided dragging means for said strip, said mechanical deviating member being driven in such a way that it will direct the strip on one or the other said inclined planes;

said piling up planes including channel shaped horizontal plates projecting from a common lateral bar, the latter being upwards and downwards slidable in a driven manner;

said cutting means being operated at least when said piling up plane reaches said lowered position;

said piling up means being moreover movable between an operational position, wherein the piling up is carried out, and a transfer and unloading position wherein the form package will be finally extracted from the apparatus;

said guiding means including roller means and conveyor means that direct said strip through said cutting means;

said conveyor means including toothed carrier belts that engage edge holes provided within the single sheets constituting the strip;

said support and piling up means including a conveyor belt being movable on control and for a prefixed time; and

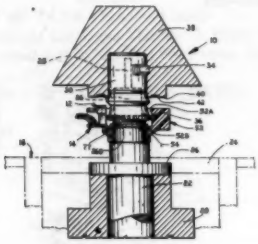
a piling up and temporary support plate, controlledly movable between a rest or retracted position and an operating position between said conveyor belt and said second pair of rollers.

4,507,110

ADJUSTABLE PHOTOSENSOR MOUNTING ARRANGEMENT FOR A CENTRIFUGE

John W. Boeckel, Hamden, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 20, 1983, Ser. No. 543,757
Int. Cl.³ H02D *5/06*
U.S. Cl. 494—10 **4 Claims**



1. In a centrifuge having a stator, a rotor mounted for rotation about an axis of rotation with respect thereto, and a speed sensor mounted to the stator and operable to generate a signal representative of the rotational speed of the rotor, the improvement which comprises:

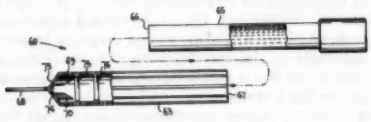
an adjusting element cooperably associated with the sensor to displace the same with respect to the stator in a direction parallel the axis of rotation to thereby locate the sensor in the optimal speed-sensing position with respect to the rotor.

4,507,111

SURGICAL SCRUB

Marvin Gordon, East Windsor, and Joseph Lichtenstein, Colonia, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Continuation-in-part of Ser. No. 241,486, Mar. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 298,246, Aug. 31, 1981, Pat. No. 4,415,288. This application Oct. 19, 1982, Ser. No. 435,335
Int. Cl.³ A61M *35/00*
U.S. Cl. 604—3 **16 Claims**



1. A surgical scrub device comprising:

an elongated hollow handle member having first and second longitudinally-spaced ends, said first end being open;

an absorbent sponge-like member disposed about said second end of said handle member;

an elongated fluid-containing cartridge adapted for longitudinal slidability in said handle member, said cartridge having a rupturable forward end by which it is inserted into said open first end of said handle member; and

first and second transvesely spaced hollow spikes formed as part of and inside said handle member proximate said second end, each spike having a pointed end projecting longitudinally toward said first end, each hollow spike providing flow communication between the interior of said handle member and respective locations within said sponge-like member through said second end of said handle member;

wherein said spikes are positioned to provide two transversely-spaced punctures in said forward end of said cartridge in response to a predetermined slidable insertion of said cartridge in said handle member;

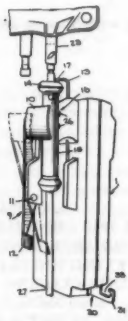
whereby each of said hollow spikes, when disposed vertically lower than the other hollow spike, serves to conduct fluid out from said handle member interior to said sponge-like member while the other hollow spike conducts vent air into the hollow member interior.

4,507,112

INFUSION MONITOR

Arie Hillel, Tel Aviv, and Simcha Borovsky, Givatayim, both of Israel, assignors to IPCO Corporation, White Plains, N.Y.

Continuation of Ser. No. 365,595, Apr. 5, 1982, abandoned. This application Feb. 21, 1984, Ser. No. 581,814
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—65 **81 Claims**



1. A liquid infusion monitor system comprising a reservoir for liquid, an infusion tube assembly operatively associated with said reservoir and including an infusion tube, a single cartridge mounted adjacent the infusion tube assembly with one side of the cartridge facing said infusion tube assembly for monitoring the amount of liquid passing through said infusion tube assembly, said cartridge having contained therein: (a) means for pre-setting the amount of liquid, (b) means for sensing the amount of fluid passing through said infusion tube assembly and (c) means for automatically increasing or decreasing the amount of liquid infused to conform to said pre-set amounts, said sensing means comprising a pair of sensing openings located on said side of said cartridge facing the infusion tube assembly, reflecting means opposite said sensing openings, said sensing means comprising means for emitting a sensing beam through one of said sensing openings toward said reflecting means and means for receiving said sensing beam through the other of said sensing openings after said sensing beam is reflected from said reflecting means, a seating surface in a wall on said cartridge, said seating surface having an open face which faces outwardly from the said cartridge and away from said wall and adapted to receive the infusion tube assembly, said sensing opening being centrally located at the base of said seating surface, said seating surface being shaped to automatically locate said infusion tube assembly within the seating surface whereby the said infusion tube assembly will automatically be properly located with respect to said sensing openings.

4,507,113

HYPODERMIC JET INJECTOR

Kenneth W. Dunlap, Long Lake, Minn., assignor to Derata Corporation, Minneapolis, Minn.

Filed Nov. 22, 1982, Ser. No. 444,048
Int. Cl.³ A61M *5/30*
U.S. Cl. 604—71 **9 Claims**

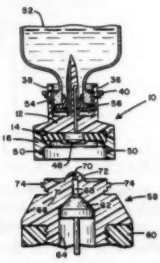
1. In a hypodermic jet injector system including a hypodermic jet injector of the type having an injector body, an injector nozzle having an orifice therethrough and attachable on one

end of said injector body, a medicament chamber within the injector body for receiving, via a delivery means, a predetermined measured quantity of medicament from a medicament supply vial and a means for forcibly ejecting said predetermined measured quantity of medicament through said orifice in said ejector nozzle, the improvement comprising:

(a) the delivery means comprises adapter means attachable to said medicament supply vial, said adapter means including:

1. a base member;

2. a stretchable membrane abutting said base member and cooperating therewith to define a generally closed recess, said stretchable membrane having a zero diameter hole formed therethrough, said membrane being in sealing relation to said recess when said membrane is in its relaxed state;



3. probe means on said base member insertible into said supply vial for conveying liquid medicament from said supply vial to said recess; and

(b) means on said injector nozzle for coupling said adapter means to said injector nozzle and distending said membrane from said relaxed state to open said zero diameter hole, said open hole being in general alignment with said orifice in said ejector nozzle for allowing flow of fluid from said recess through said orifice into said medicament chamber.

4,507,114

MULTIPLE CHAMBER CONTAINER HAVING LEAK DETECTION COMPARTMENT

Paul Bohman, Wildwood; John Hart, Winnetka, and Gene Fabisiewicz, Mt. Prospect, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 21, 1983, Ser. No. 544,190

Int. Cl.[3] **B65D** *25/08, 81/32*

U.S. Cl. 604—111 **10 Claims**

1. A container for the storage of at least two substances, comprising:

(a) first and second chambers defined by a container wall, at least one of said first and second defined chambers containing a liquid substance;

(b) chamber-communicating means having first and second ends secured to and in communication with said first and second chambers, respectively, said chamber-communicating means defining a selectively openable flowpath between said first and second chambers; and

(c) a normally empty leak detection compartment defined by a detection wall, enclosing said chamber-communicating means between said first and second chambers, such that any liquid which unintentionally passes between said chamber-communicating means and said container wall

from either of said chambers enters said leak detection compartment, facilitating detection of a leak.

4,507,115

MEDICAL CAPSULE DEVICE

Koji Kambara; Kazuo Misawa; Mikio Honda; Koichi Matsui, and Kitijiro Kohri, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

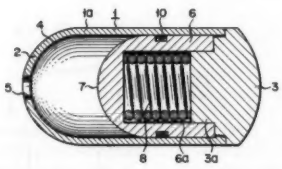
Continuation of Ser. No. 361,790, Mar. 25, 1982, abandoned. This application Feb. 28, 1984, Ser. No. 583,289

Claims priority, application Japan, Apr. 1, 1981, 56/49184

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.[3] **A61M** *7/00*

U.S. Cl. 604—135 **7 Claims**



1. A medical capsule device comprising:

a capsule body having opposite end walls which have curved outer surfaces, at least one chamber formed in said capsule body, one of said end walls of said capsule body having a curved inner surface defining a curved inner end surface of said at least one chamber, and a communicating path for communicating said at least one chamber with the outside;

a movable piston-like member having a curved end face, said movable piston-like member being arranged in said at least one chamber and being in liquid-tight sealing relationship with internal walls of said at least one chamber, said movable piston-like member being slidable relative to said internal walls of said at least one chamber and being movable between (i) a liquid-receiving position at which said curved end face of said movable piston-like member is spaced apart from said curved inner end surface of said at least one chamber so that the volume of said at least one chamber is made largest and (ii) a liquid-pushing position at which said curved end face of said movable piston-like member closes to said curved inner end surface of said at

least one chamber so that the volume of said at least one chamber is made smallest;

a coiled operating member arranged in said capsule body to selectively move said movable member to said liquid-receiving and liquid-pushing positions, said operating member being made of a shape memory alloy whose crystalline structure is transformed to martensite and mother phases responsive to heat applied thereto, said coiled operating member being contracted under said martensite phase to move said movable member to one of said liquid-receiving and liquid-pushing positions, and being extended under said mother phase to move said movable member to the other of said liquid-receiving and liquid-pushing positions;

and

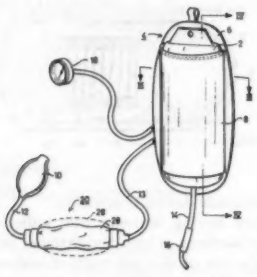
said communicating path comprising a small opening formed through said one of said end walls of said capsule body and which is sufficiently small so that the liquid in said at least one chamber is prevented from passing to the outside through said opening unless said movable member moves from said liquid receiving position to said liquid-pushing position.

4,507,116

APPARATUS FOR THE INDUCED INFUSION OF A LIQUID FROM A FLEXIBLE LIQUID BAG

Saúl Leibinsohn, 11 Olei Hagardom St., Rishon Lezion, Israel

Filed Sep. 30, 1982, Ser. No. 429,674
Claims priority, application Israel, Apr. 22, 1982, 65580
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—142 **16 Claims**



1. Apparatus for the induced infusion of a liquid from a flexible liquid bag, comprising:

a hand-operable pumping bulb;

elastic inflatable means coupled to said bulb for inflation by a fluid pumped therein by operating said bulb;

and a sleeve for retaining the bag firmly pressed against a first portion of said elastic inflatable means for applying the pressure thereof to said bag in order to induce infusion of the liquid therefrom;

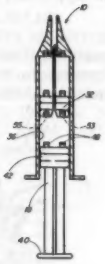
characterized in that a second portion of said inflatable means serves as an accumulator for accumulating pressurized fluid pumped by said bulb, and comprises an outer non-elastic sheath enclosing said latter portion of the elastic inflatable means for limiting the accumulation of the pressurized fluid therein.

4,507,117

SYRINGE APPARATUS WITH RETRACTABLE NEEDLE

Herbert C. Vining, R.R. 1, Box 339 HV, and Clara G. Ryan, R.R. 1, Box 399 FG, both of Patterson, La. 70392

Filed Jul. 11, 1983, Ser. No. 512,272
Int. Cl.³ A61M *5/22*
U.S. Cl. 604—196 **8 Claims**



1. A syringe apparatus, which comprises:

a. a substantially cylindrical barrel portion;

b. a needle portion, at least partially contained within said hollow barrel bore portion, and at times partially extruding therefrom;

c. a plunger portion insertable in the second end of said barrel portion then movable within said barrel portion;

d. means for engaging and disengaging said needle portion to said plunger portion, so that in the engaged position, said needle portion moves in unison with said plunger portions;

e. means for engaging said needle portion to the first end of said barrel portion, so that in the engaged position, the point of said needle portion is extruding from said plunger portion and fixedly attached thereto; and

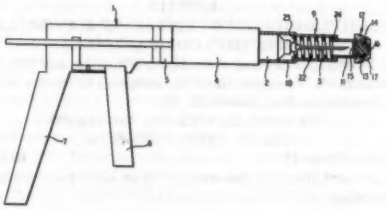
f. means for disengaging said needle portion from said barrel portion and retracting said needle completely into the hollow of said barrel portion.

4,507,118

FITMENTS FOR INJECTION DEVICES

Hugh R. Dent, Stroud, England, assignor to Sterimatic Holdings Limited, Tortola, British Virgin Isls.

Filed Jul. 1, 1983, Ser. No. 510,752
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—198 **12 Claims**



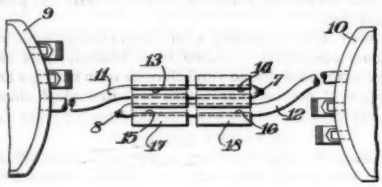
1. A sterilising fitment for an injection device of the kind in which injection liquid is delivered through a hollow needle, the fitment being provided to sterilise the needle prior to its application to the site of injection and again on withdrawal of the needle from the site of injection, which fitment comprises a collapsible sleeve for surrounding the needle, means at one end of the sleeve for attaching the sleeve to a needle support of the injection device, and a sterilising substance holder releasably carried by the other end of the sleeve to close off said other end so as to enclose the needle, the holder comprising an

enclosure containing sterilising means, and the two ends of the collapsible sleeve being reciprocable relative to one another in the direction of the length of the needle and being resiliently biased in the extended position, whereby, in use, when an injection is effected by placing said other end of the sleeve against the injection site and applying pressure to the injection device in a direction towards the injection site, the point of the needle moves through the sterilising means within the enclosure into the injection site as the sleeve collapses under the applied pressure and subsequently moves back into the sleeve through the sterilising means as the sleeve reassumes its extended position on release of said pressure, and the holder may subsequently be replaced on said other end of the sleeve by a holder containing fresh sterilising means.

4,507,119
STERILE DOCKING PROCESS, APPARATUS AND SYSTEM

Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 6, 1982, Ser. No. 395,794
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—280 **28 Claims**



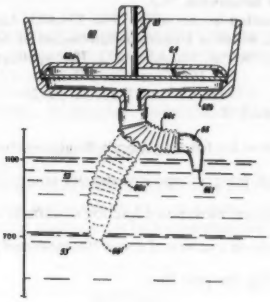
1. A process for joining first and second thermoplastic tubes together comprising (1) urging a hot stream of fluid to sever either through both said tubes transversely of the axis of each tube or through opposing side sections of said tubes substantially perpendicular to the axis of said tubes to form continuous contact between the hot fluid stream, the interior of each tube and molten tube portions thereby formed; and (2) urging the molten portions of the first tube and the second tube together to form a joint between said first and second tubes while removing said hot stream.

4,507,120
SUCTION CANISTER WITH CORRUGATED ADJUSTABLE SUCTION INLET

Joseph R. Paradis, 60 Plymouth Rd., Holden, Mass. 01520

Filed Apr. 21, 1982, Ser. No. 370,562
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—320 **9 Claims**

1. A closure for a collection container comprising
an inlet for fluidic material to be collected in the container;
means for applying suction to said closure;
a suctional inlet means suspended from said closure and extending downwardly to the cut-off level of the fluidic material to be collected; and
a filter chamber containing a semi-permeable filter element interposed in said inlet between the opening thereof and said closure;

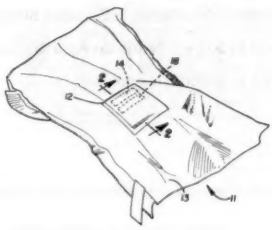


said suctional inlet means being positionable by an adjustable corrugated extension at different cut-off levels.

4,507,121
DISPOSABLE DIAPER WITH ISOLATED WETNESS INDICATOR

Martin C. Leung, 656 Scorpio Ln., Foster City, Calif. 94404

Filed May 2, 1983, Ser. No. 490,883
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—361 **14 Claims**



1. In a disposable diaper having an inner layer of materials for absorbing bodily excretions and a water-impermeable backsheet retaining the inner layer of absorbing materials and bodily excretions absorbed thereby, the combination comprising,
a first layer of moisture-wicking material located on the exterior surface of the backsheet,
an opening through the water-impermeable backsheet for providing liquid communication between the inner layer of absorbing materials and the first layer of moisture-wicking material,
a strip of moisture-wicking material impregnated with moisture-indicating materials for absorbing liquid from the first layer of moisture-wicking materials,
a third layer of moisture-wicking material for absorbing liquid from the strip of moisture-wicking materials impregnated with moisture-indicating materials for providing unidirectional flow of liquid components of the bodily excretions from the opening through the backsheet into the third layer of moisture-wicking materials through the strip of moisture-wicking materials impregnated with moisture-indicating materials,
a semi-transparent, water-impermeable sheet covering first, and third layers and the strip of wicking materials, and
means securing the semi-transparent sheet to the backsheet to provide an isolated pocket securing the first and third layers and the strip of wicking materials in position over the opening through the backsheet.

4,507,122

LOW DENSITY PEAT MOSS BOARD

Yvon Levesque, Montreal, Canada, assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 174,403, Aug. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 7,280, Jan. 30, 1979, Pat. No. 4,215,692. This application May 12, 1982, Ser. No. 377,532

Int. Cl.[3] A61F *13/16, 13/20*

U.S. Cl. 604—375 21 Claims

1. A method for forming a body fluid absorbent board having structural integrity and low density comprising:

separating peat moss into a fraction of a size at least sufficient to remain on a screen of about 100 mesh and peat fines and discarding the peat fines;

forming a slurry of said peat moss fraction in combination with mechanical woodpulp fines having a Canadian Standard Freeness of from 60 to 500; and

forming a board from said slurry, the board having a dry density of from about 0.03 to about 0.09 gm/cc.

12. A body fluid absorbent board comprising:

a mixture of peat moss having a particle size at least sufficient to remain on a screen of about 75 mesh, and mechanical wood pulp fines having a Canadian Standard Freeness of from 60 to 500; the board having a dry density of from about 0.03 to about 0.09 gm/cc.

4,507,123

MEDICAL CONTAINERS

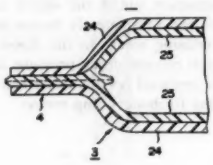
Takao Yoshida, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,217

Claims priority, application Japan, May 28, 1982, 57/89864

Int. Cl.[3] A61M *5/00*

U.S. Cl. 604—408 22 Claims



1. A medical container for housing a liquid, comprising:

means defining a liquid receiving chamber, said means comprising two sheets, each of said sheets having an inner layer and an outer layer superposed on each other and defining a common peripheral edge portion which extends around said chamber, said common peripheral edge portion being sealed together such that the inner layer of one of said sheets adjoins and is sealed to the inner layer of the other of said sheets in said common peripheral edge portion,

said outer layer comprising a soft vinyl chloride resin compound comprising a first vinyl chloride resin and a plasticizer; and

said inner layer comprising a soft vinyl chloride resin compound comprising a second vinyl chloride resin and a plasticizer, said second vinyl chloride resin having a lower degree of polymerization than said first vinyl chloride resin.

4,507,124
1:2 METAL COMPLEXES OF AZOMETHINE DYES HAVING ARYLAZO GROUPS

Alois Püntener, Rheinfelden, and Fabio Beffa, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

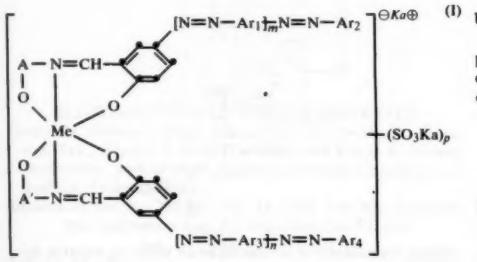
Filed Jun. 20, 1983, Ser. No. 505,647

Claims priority, application Switzerland, Jul. 2, 1982, 4053/82

Int. Cl.³ C09B *45/24*

U.S. Cl. 534—695 **6 Claims**

1. A metal complex dye of the formula I



(I)

in which Me is cobalt or chromium, A and A′ independently of each other are each the radical of an amine of the benzene series which carries the hydroxyl group in o-position relative to the azomethine group, Ar_1 and Ar_3 independently of each other are each a substituted or unsubstituted phenylene or naphthylene radical, Ar_2 and Ar_4 independently of each other are each a substituted or unsubstituted benzene or naphthalene radical, m and n independently of each other are each 0 or 1, p is an integer from 4 to 6 and $Ka^{\oplus}$ is a cation.

4,507,125
USE OF 1:2 CHROME COMPLEX DYES FOR DYEING LEATHER AND FURS

Alois Püntener, Rheinfelden, and Josef Koller, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

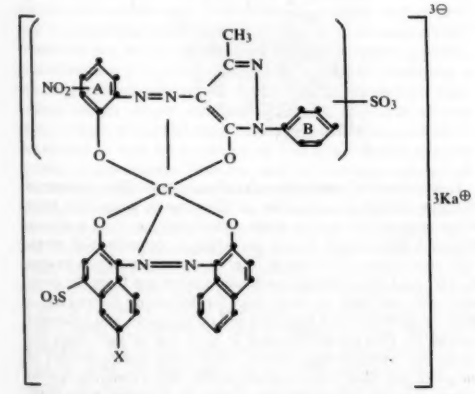
Filed Oct. 26, 1983, Ser. No. 545,554

Claims priority, application Switzerland, Nov. 2, 1982, 6366/82

Int. Cl.³ C09B *45/16;* **D06P** *3/30*

U.S. Cl. 8—437 **10 Claims**

1. A process for dyeing leather or furs, comprising the step of applying thereto a 1:2 chrome complex dye of the formula



wherein X is chlorine or nitro, and wherein the sulfo group in the pyrazolone dye is in ring A or B, and the nitro group is in ring A at the 4-, 5- or 6-position of the 1-hydroxy-2-aminobenzene.

4,507,126
COLD WATER DISPERSIBLE DYESTUFF GRANULATES

Paolo Balliello, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1984, Ser. No. 606,078

Claims priority, application Switzerland, May 4, 1983, 2426/83

Int. Cl.³ D06P *67/02*

U.S. Cl. 8—526 **10 Claims**

1. A cold water dispersible dyestuff granulate which comprises at least one water-soluble dye, an anionic dispersant and optionally further auxiliaries, which granulate contains at least one amphoteric surfactant.

4,507,127
SYSTEM FOR RECOVERING RESOURCES FROM SLUDGE

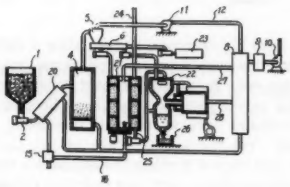
Yasuo Hirose, Kanagawa, Japan, assignor to Nippon Furnace Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,963

Claims priority, application Japan, Dec. 21, 1981, 56-205251; Dec. 21, 1981, 56-205252; Dec. 21, 1981, 56-205253; Mar. 23, 1982, 57-044553; Mar. 23, 1982, 57-044554; May 25, 1982, 57-087296

Int. Cl.³ C10J *3/20, 3/30*

U.S. Cl. 48—89 **5 Claims**



1. An apparatus for recovering resources from sludge comprising

a hopper to hold sludge to be processed,

a forced supply means on the bottom of said hopper, concentration means connected to said hopper, said forced supply means being for forcing sludge from said hopper to said concentration means in which sludge is heated and dehydrated,

drying furnace means having a fluidized sand bend and connected to said concentration means,

a blower downstream of and connected to said furnace means which draws dried sludge products from said furnace to separator means connected to said furnace means, in which separator means solid and gas components of dried sludge are separated, heat exchanger means located downstream from and connected to said blower, said blower being capable of pressurizing said gas and feeding it downstream to said heat exchanger where the gas is heated,

recycle means downstream of and connected to said heat exchanger for returning part of the gas to said drying furnace means and for returning the remainder of the gas to said concentration means,

supply means downstream of said separator for supplying dried sludge solids to a gasification apparatus to recover gaseous fuel, and to an ash disposer connected with said gasification apparatus in which ash is allowed to solidify from melted sludge ash to recover massive ash, said gasification apparatus including a cylindrical combustion chamber having a gas burner in the bottom thereof, said com-

bustion chamber having a rotable peripheral wall with outwardly extending agitating vanes and means for rotating said peripheral wall, a distillation chamber around said combustion chamber into which the vanes extend, said supply means communicating with the top of the distillation chamber, said distillation chamber further including a gaseous fuel exit at the top thereof, and a feed pipe for gas for promoting volitilization and an ash exit communicating with the bottom of said distillation chamber,

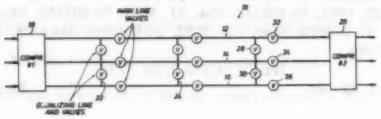
and means downstream of and connected with said concentration means for removing the liquid drained from a gas supplied to the concentration means and the gas evaporated in said concentration means.

4,507,128

PNEUMATIC LINE BREAK CONTROL SYSTEM AND METHOD

Robert O. Werner, 14526 Broadgreen, Houston, Tex. 77079

Filed Jul. 6, 1982, Ser. No. 395,704
Int. Cl.³ F16K *31/00*
U.S. Cl. 48—193 **24 Claims**



1. A system for detecting and isolating a rupture in a gas transmission network incorporating plural gas transmission lines having main line valves located at intervals therealong and having valve controlled equalizing lines interconnecting said transmission lines at intervals therealong, said system comprising:

(a) first and second pipeline valve selector means being in controlling relation with said main line valves and equalizing line valves;

(b) flow controlled actuator means being coupled to said first and second selector means and being positionable in selective actuating relation with said first and second selector means responsive to the direction and velocity of gas flow in said equalizer line;

(c) flow detector means being located in said equalizing line and developing output signal means responsive to detection of flow, said output signal means being responsive to the direction and velocity of flow being detected and selectively energizing said flow controlled actuator means for selective closing of said first and second pipeline valve selector means to isolate the ruptured main line section; and

(d) compensating means rendering said flow controlled actuator means responsive only to flow in said equalizer line of sufficient duration to clearly indicate a condition of pipeline rupture.

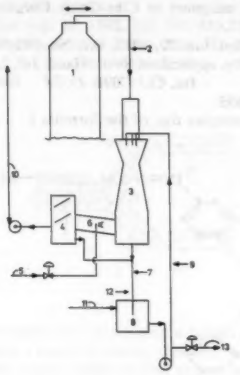
4,507,129

METHOD OF CLEANING DUST-CONTAINING GAS MIXTURES FROM A UREA PLANT

Harald Storen, Porsgrunn, Norway, assignor to Norsk Hydro a.s., Oslo, Norway

Filed Dec. 22, 1982, Ser. No. 452,045
Claims priority, application Norway, Jan. 7, 1982, 820030
Int. Cl.³ B01D *47/06*
U.S. Cl. 55—70 **4 Claims**

1. In a method for cleaning a dust-containing gas mixture from a urea plant, wherein said gas mixture is washed by an aqueous solution, the improvement comprising:



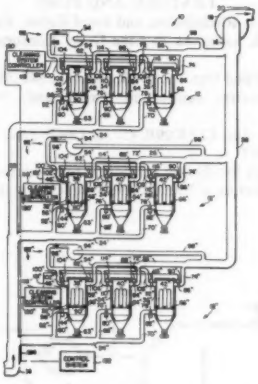
adding formaldehyde to said aqueous washing solution before bringing said solution into contact with said gas mixture.

4,507,130

STAGGERED METHOD CLEANING CYCLE FOR FABRIC FILTER SYSTEM INCLUDING MULTIPLE-BAGHOUSES

Alfred H. Roth, Annville, Pa., assignor to General Electric Environmental Services, Inc., Lebanon, Pa.

Filed Mar. 21, 1983, Ser. No. 477,566
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—96 **1 Claim**



1. A method of controlling the cleaning of a filter system of the type including a plurality of filter hoses, with each filter house arranged to receive particulate-laden gas from a source, and each filter house in turn including a common inlet manifold; a plurality of individual filter compartments each having an inlet duct for receiving particulate-laden gas from the common inlet manifold, an outlet duct for delivering filtered gas, a filter element between said inlet and outlet ducts, and a damper system for selectively blocking at least one of said ducts for taking the compartment off-line while other compartments of the particular filter house remain on-line; and a cleaning system common to the compartments of each filter house, each common cleaning system capable of being initiated to execute a filter house cleaning cycle and operable during a filter house

cleaning cycle to clean the filter elements in a compartment-by-compartment sequence wherein each compartment being cleaned is off-line while other compartments are on-line; said method comprising:

initiating the cleaning cycles of individual filter houses at different times such that the filter house cleaning cycles are staggered, whereby the cleaning cycles are initiated at times which ensure that the time of peak gas flow resistance of one filter house does not coincide with the time of peak gas flow resistance of another filter house.

4,507,131

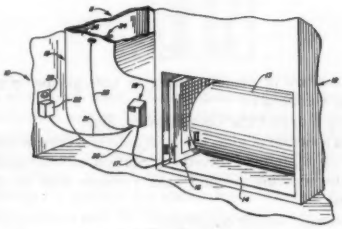
ELECTRONIC AIR FILTERING APPARATUS

George H. Fathauer, Mesa, Ariz.; James M. Fowler, Jr., Houston, Tex.; Edward J. Rylicki, Powell, and Edwin E. Mason, Rockbridge, both of Ohio, assignors to Masco Corporation of Indiana, Taylor, Mich.

Division of Ser. No. 285,417, Jul. 22, 1981, Pat. No. 4,410,934. This application Aug. 12, 1983, Ser. No. 522,861

Int. Cl.³ B03C *3/32, 3/68*

U.S. Cl. 55—104 **5 Claims**



1. Air filtering apparatus for use in a forced air system, said apparatus comprising: a filter cell including ionizing and collecting means, a high voltage power supply connected to said ionizing and collecting means, and control means connected to said power supply for controlling activation of said power supply, said ionizing and collecting means of said filter cell having elements arranged with respect to each other to cause ozone generation to occur due to arcing caused by moisture and particulate matter and also by the existence of a cleaning solution in the filter cell prior to drying thereof, said control means comprising timer means operative between reset and set conditions and having an output at which an output signal of a predetermined form is developed only in said set condition, a coupling between said output of said timer means and said high voltage power supply arranged to prevent activation of said power supply when said output signal of predetermined form is developed in said set condition of said timer means, current sensing means coupled between said high voltage supply and said ionizing and collecting means and arranged to develop a triggering signal in response to excessive current resulting from an arcing condition in said ionizing and collecting means, and means for applying said triggering signal to said timer means to rapidly switch said timer means to said set condition and to prevent activation of said power supply at any time when an excessive current condition is developed, said timer means being so constructed and arranged as to be thereafter maintained in said set condition for a long time interval of at least an order of magnitude equal to the minimum time required for drying of said filter cell after cleaning thereof to prevent rapidly repeated reactivation of said power supply under any conditions.

4,507,132

FUEL EVAPORATION PREVENTING DEVICE

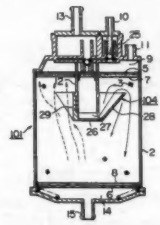
Shigeru Yoshida, Ohbu, Japan, assignor to Aisan Industry Co., Ltd., Ohbu, Japan

Filed Jul. 10, 1984, Ser. No. 629,456

Claims priority, application Japan, Aug. 12, 1983, 58-148497

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—320 **2 Claims**



1. A fuel evaporation preventing device comprising: a casing; and absorbent filling said casing and adapted to absorb the fuel vapor; a fuel vapor introduction pipe having one end embedded in the layer of said absorbent; and a flow deflector opening towards said fuel vapor introduction pipe; wherein said flow deflector has a plurality of box-shaped pleats defining a plurality of slits extending vertically.

4,507,133

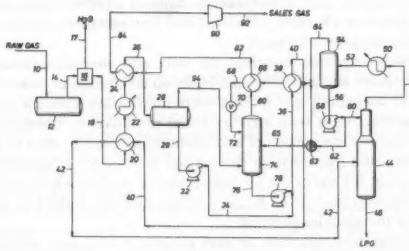
PROCESS FOR LPG RECOVERY

Shuaib A. Khan, and James Haliburton, both of Calgary, Canada, assignors to Exxon Production Research Co., Houston, Tex.

Filed Sep. 29, 1983, Ser. No. 537,127

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—29 **17 Claims**



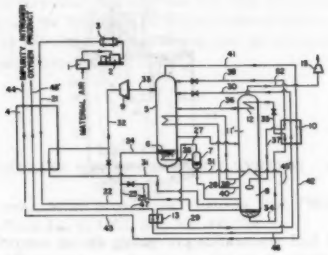
1. In a process for separating propane and heavier hydrocarbons from a gaseous feedstream containing hydrocarbon components of different boiling points wherein said feedstream is cooled and separated into a first vapor fraction and a first liquid fraction and said first liquid fraction is distilled in a deethanizer to form a second vapor fraction and a second liquid fraction, the improvement which comprises expanding and transferring said first vapor fraction to the lower portion of a direct heat exchanger, cooling said second vapor fraction to form a substantially liquefied stream, transferring at least a portion of said liquefied stream to the upper portion of said direct heat exchanger whereby said liquefied stream contacts said first vapor fraction to form a third vapor fraction and a third liquid fraction, returning said third liquid fraction to said deethanizer, and removing said third vapor fraction from said direct heat exchanger.

4,507,134

AIR FRACTIONATION METHOD

Yasushi Tomisaka, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 2, 1983, Ser. No. 500,572
Int. Cl.[3] F25J 3/04
U.S. Cl. 62—30 1 Claim



1. A method for fractionation of air utilizing a compressor, a first condenser, a low pressure column having an upper portion, a medium-pressure column, a second condenser located at the top of a crude argon column, a reversible heat exchanger and a blower, which comprises:

feeding material air compressed by said compressor and cooled by said heat exchanger to said first condenser;

subjecting the material air to heat exchange with liquefied oxygen in said low pressure column to evaporate said liquefied oxygen and form an ascending gas in said low-pressure column and, simultaneously, super-cooling the material air to a temperature below the boiling point thereof so as to cause partial liquefaction thereof;

contacting said ascending gas with a reflux liquid from said upper portion of said low-pressure column to effect fractionation thereof and thereby convert a reflux liquid collected in a bottom portion of said low-pressure column to an oxygen-rich liquid;

introducing said liquefied air into said medium-pressure column and gasifying said liquefied air therein to produce an ascending gas in said medium-pressure column and contacting it with a reflux liquid produced by condensation at a top portion of said medium-pressure column so as to cause fractionation thereof and provide a nitrogen-rich gas at the top of the medium-pressure column while transforming said reflux liquid into liquefied air at the bottom of the medium-pressure;

cooling said liquefied air and passing it into said second condenser located at the top of said crude argon column;

subjecting said liquefied air to heat exchange with an argon-rich gas in the crude argon column so as to gasify the liquefied air prior to feeding the liquefied air into the low-pressure column, and which further comprises withdrawing liquefied oxygen from the bottom of said crude argon column, pressurized under its own weight, and gasifying the liquefied oxygen by said reversible heat exchanger to provide an oxygen product while withdrawing an argon-rich gas at the top of said crude argon column by means of said blower so as to maintain the internal pressure of the crude argon column at a reduced pressure; and

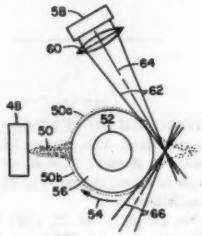
maintaining the internal pressure of said crude argon column at about 0.8 to about 1.0 ata and the liquefied oxygen at about 1.0 ata to about 1.2 ata, solely by said blower and a static head of liquid oxygen of predetermined height.

4,507,135

METHOD OF MAKING OPTICAL FIBER PREFORM

Theodore F. Morse, Providence, R.I., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,425
Int. Cl.[3] C03B 37/01
U.S. Cl. 65—3.12 2 Claims



1. In a method of manufacturing an optical fiber preform, comprising the steps of:

providing a cylindrical core member, and

directing a stream of glass particles onto said core member to build up a preform thereon, a portion of said stream of particles flowing around said preform and being exhausted,

the improvement which comprises:

directing a pair of laser beams through that portion of said stream which has not yet impinged upon said preform, the axes of said beams being parallel to the axis of said core member, the axes of said beams being disposed at opposite sides of said stream of particles, the combined effect of said laser beams inducing a temperature gradient within said portion of said stream to confine said stream, whereby some of the glass particles that would have been exhausted are driven by thermophoretic force onto the surface of said preform, the directions of said beams being such that the axes thereof do not intersect with said cylindrical core member nor with any deposit that forms thereon.

2. In a method of manufacturing an optical fiber preform, comprising the steps of:

providing a cylindrical core member,

directing a stream of glass particles onto said core member to build up a preform thereon, a portion of said stream of particles flowing around said preform and being exhausted,

the improvement which comprises:

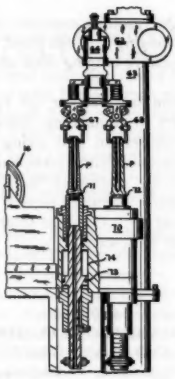
directing a beam of laser light such that the outer region thereof, which is essentially zero intensity, is tangential with the outer surface of said preform in the vicinity of a portion of said stream which flows around said preform, a portion of said laser beam thereby passing through said portion of said stream which flows around said preform, to induce a temperature gradient within said portion of said stream, whereby some of the glass particles that would have been exhausted are driven by thermophoretic force onto the surface of said preform, the direction of said beam being such that the axis thereof does not intersect with said cylindrical core member nor with any deposit that forms thereon.

4,507,136

METHOD FOR MAKING GLASS BOTTLES

John D. Northup, Toledo, Ohio, assignor to John D. Northup, Jr.; Mary E. Northup and Nancy N. Lehrkind, a part interest to each

Continuation-in-part of Ser. No. 286,970, Jul. 27, 1981, abandoned, and Ser. No. 398,363, Jul. 14, 1982, abandoned. This application Aug. 26, 1983, Ser. No. 526,545
Int. Cl.³ C03B 9/14
U.S. Cl. 65—79 9 Claims



1. A method of manufacturing glass containers on a stationary, individual section bottle machine having a parison forming position and a blow mold position including, in combination, introducing a gob of molten glass into a parison forming device, forming a glass parison, cooling the glass parison, transferring the parison to a station intermediate to the parison forming position and the blow mold position the intermediate station being spaced from and exterior to both the parison forming station and the blow mold station, mechanically stretching the parison to a desired length while it is at the intermediate station, transferring the elongated parison to a blow mold, having a blow mold cavity, and expanding and cooling the parison to form a glass container.

4,507,137

DRIVEN ROLLER TUBE CONVEYOR

Ralston G. Edwards, Jr., Newfield; John R. B. Walkden; Walter H. Carstensen, both of Vineland; Gregory E. Murphy, Erial, and John E. Lisi, Newfield, all of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

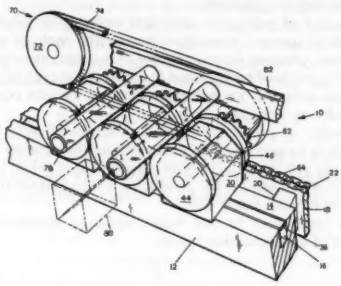
Division of Ser. No. 280,579, Jul. 6, 1981, Pat. No. 4,433,776. This application Nov. 30, 1983, Ser. No. 556,728
Int. Cl.³ C03B 25/06
U.S. Cl. 65—109 4 Claims

1. A method of conveying and rotating tube stock for tooling finishing on an end of each of the stock, the method comprising the steps of:

A. rotating the tube stock with rollers that are rotated with a predetermined surface speed by means of a rotary drive,

B. overrunning the rotary drive of the rollers by engaging the tube stock with a second drive means driving said tube at a predetermined greater speed, thereby allowing the rollers to rotate freely, and

C. rotating the stock faster for tooling finishing by the second drive means to provide constant non-slipping contact



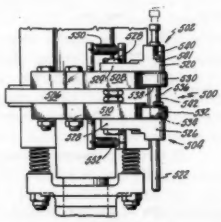
between the stock and rollers to reduce abrasion and improve tooled finish appearance and quality.

4,507,138

DELIVERY SYSTEM FOR GLASSWARE FORMING MACHINE

Charles M. Kingsbury, Manchester; Bruce R. Beckwith, Unionville, and Anthony Messina, Enfield, all of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 4, 1983, Ser. No. 472,315
Int. Cl.³ C03B 7/16
U.S. Cl. 65—158 6 Claims



1. In a delivery system of a glassware forming machine of the type having a main rotating table including a plurality of forming units spaced about the periphery thereof, each unit having at least two blank molds which, in operation, rotate about a first axis at a first and second radius respectively, the machine provided with at least two gob guiding units for periodically guiding gobs of molten glass to a corresponding one of said blank molds at predetermined respective positions thereof about said first axis, each said gob guiding unit comprising a scoop, a trough, and a deflector mounted on a pivotable frame for being oscillated about a second axis parallel to said first axis, the improvement comprising:

a plurality of vertical pivot shafts each pivotably secured to a respective one of said gob guiding unit frames;

a plurality of support arms having one end fixedly connected to one end of a respective one of said pivot shafts and the other end secured to a respective one of said scoops, each said support arm being pivotable about the axis of its respective pivot shaft;

a plurality of actuating means each secured to the other end of a respective one of said pivot shafts for pivoting the corresponding one of said support arms about its respective pivot shaft axis to move the corresponding one of said scoops between a delivery position and a reject position; and

means for selectively rejecting any or all of the gobs intended for delivery to a predetermined one of said blank

molds by causing ones of said actuating means to move their corresponding scoops to a reject position.

2. An apparatus according to claim 1 wherein said selective rejection means comprises:

a plurality of gob reject actuators mounted on each of said forming units for rotation therewith, each of said gob reject actuators corresponding to a respective one of the blank molds of each of said forming units, each of said gob reject actuators for being set in either a reject position or a delivery position;

a plurality of proximity gob reject sensors fixedly secured relative to said machine for detecting the passage of those of said gob reject actuators placed in said reject position, each of said sensors for producing a reject signal representative of said detection;

means responsive to said reject signal to actuate selected ones of said actuating means.

4,507,139

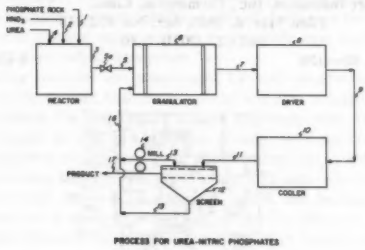
ACID TYPE SOLID UREA-NITRIC FERTILIZER

Jack M. Sullivan; Yong K. Kim, both of Florence, and Kjell R. Waerstad, Tuscumbia, all of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 612,162, May 21, 1984,. This application Oct. 26, 1984, Ser. No. 665,844

Int. Cl.³ C05C *9/00*; C05B *11/06*

U.S. Cl. 71—50 **17 Claims**



PROCESS FOR UREA-NITRIC PHOSPHATES

1. A new composition of matter having the molecular formula, $Ca(H_2PO_4)(NO_3).CO(NH_2)_2$, and having the following x-ray powder diffraction pattern:

d, Å	I/Io	d, Å	I/Io
12.45	100	2.319	7
5.12	18	2.178	7
4.73	12	2.078	3
4.63	8	2.071	3
4.61	5	1.991	1
4.135	9	1.971	2
3.914	20	1.922	3
3.902	35	1.829	1
3.875	40	1.790	2
3.214	27	1.775	4
3.170	16	1.691	3
3.140	45	1.568	2
3.105	20	1.460	1
2.915	3	1.397	1
2.844	19	1.281	1
2.720	2	1.273	<1
2.644	14	1.242	<1
2.558	2	1.217	1
2.505	11		

2. A method for the preparation of solid urea nitric phosphate fertilizer products having agronomically advantageous low pHs ranging from about 1 to about 4 and having enhanced storage characteristics including high critical relative humidity, which process comprises the steps of:

(1) introducing into a reactor nitric acid and finely divided particulate phosphate rock in proportions such that the mole ratio of HNO_3:CaO introduced and maintained in said reactor ranges from about 1.2 to about 2.1;

(2) maintaining the materials introduced into said reactor for a period of time ranging from about 30 minutes to about 2 hours at temperatures ranging between about 60° C. and about 100° C.;

(3) subsequently introducing into said reactor urea in proportions such that the mole ratio of urea:CaO in said reactor is adjusted to the range of between about 1.6 to about 4;

(4) maintaining the resulting materials in said reactor for a period of time ranging between about 1 and about 2 hours and at a temperature ranging from about 30° C. to about 70° C.; and

(5) removing from said reactor the resulting urea nitric phosphate slurry to granulating, drying and sizing steps, respectively, wherefrom said sizing step is recovered onsize particulate urea nitric phosphate;

said product urea nitric phosphate characterized by the fact that the critical relative humidity thereof ranges upwards to about 60 percent, and the P_2O_5 water solubility thereof ranges upwards from about 70 percent.

4,507,140

TRIAZOLE AND IMIDAZOLE COMPOUNDS USEFUL AS FUNGICIDES AND PLANT GROWTH REGULATORS

Balasubramanyan Sugavanam, Wokingham, England, assignor to Imperial Chemical Industries PLC, London, England

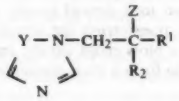
Filed Nov. 3, 1981, Ser. No. 317,853

Claims priority, application United Kingdom, Nov. 19, 1980, 8037103; Jan. 12, 1981, 8100804; Jan. 29, 1981, 8102703; Mar. 23, 1981, 8109024; Jul. 3, 1981, 8120670

Int. Cl.³ A01N *43/50, 43/64*; C07D *233/60, 249/08*

U.S. Cl. 71—76 **6 Claims**

1. A triazole compound selected from the group consisting of



wherein R^1 is —C≡C—X where X is alkyl of 1–4 carbons or halophenyl; R^2 is alkyl of 1–4 carbons or halophenyl; Z is OR^3 where R^3 is hydrogen or alkyl of 1–4 carbon atoms; and Y is =N—; and the acid-addition salts and metal complexes thereof.

6. A method of combating fungal diseases in a plant, or regulating the growth of a plant, which method comprises applying to the plant, to seed of the plant, or to the locus of the plant or seed, an effective amount of a compound or a salt or metal complex thereof as defined in claim 1.

4,507,141

TRIAZOLYLALKYL-THIOETHER PLANT GROWTH REGULATORS AND FUNGICIDES

Erik Regel, Wuppertal; Karl H. Büchel, Burscheid; Klaus Lürssen, Bergisch-Gladbach, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

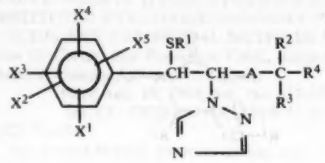
Filed Mar. 2, 1982, Ser. No. 354,122

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1981, 3108770

Int. Cl.³ A01N *43/64*; C07D *249/08*

U.S. Cl. 71—76 **11 Claims**

1. A triazolylalkyl-thioether of the formula



in which

A represents the keto group or the CH(OH) group,

R^1 represents alkyl with 1 to 4 carbon atoms of phenyl optionally substituted by at least one of fluorine, chlorine, bromine and alkyl with 1 to 4 carbon atoms,

R^2 represents alkyl with 1 to 4 carbon atoms,

R^3 represents alkyl with 1 to 4 carbon atoms,

R^4 represents alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 to 4 carbon atoms and 1 to 5 halogen atoms, or represents alkylthiomethyl with 1 to 4 carbon atoms in the alkyl moiety,

X^1 represents hydrogen, fluorine, chlorine or bromine,

X^2 represents hydrogen, fluorine or chlorine, and

X^3 represents hydrogen or chlorine,

or an acid addition salt or metal salt complex thereof.

8. A fungicidal or plant-growth-regulating composition, comprising a fungicidally or plant-growth-regulating effective amount of a compound, salt or complex according to claim **1** in admixture with a diluent.

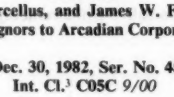
4,507,142

ALPHA-OXIMINO ALKANOIC ACID CONTAINING FOLIAR FERTILIZERS TO INCREASE YIELD OF CROP PLANTS

Gary M. Pace, Marcellus, and James W. Friedrich, Cortland, both of N.Y., assignors to Arcadian Corporation, Inc., Parsippany, N.J.

Filed Dec. 30, 1982, Ser. No. 454,797
Int. Cl.³ C05C *9/00*
U.S. Cl. 71—83 **28 Claims**

1. A aqueous foliar fertilizer composition of the type which is applied to the foliage of plants, said composition containing nitrogen, and an effective amount of one or more alpha-oximino alkanoic acids and esters, sulfamides and salt derivatives thereof having the general formula:



wherein:

n is an integer from 1 to 12;

R is selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloalkenyl, aralkyl, nitro, alkylaryl, aryl, heterocyclic, alkenyl and alkynyl; and

X is selected from the group consisting of OZ, SZ, NZZ' and OZ", wherein Z and Z' are the same or different and are independently selected from the group consisting of hydrogen, alkyl, cycloalkyl, cycloalkenyl, aralkyl, alkylaryl, aryl, heterocyclic, alkenyl and alkynyl, and wherein Z" is an alkali metal.

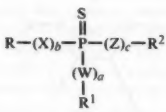
4,507,143

ORGANOTHIOPHOSPHOROUS COMPOUNDS USEFUL AS ANTIDOTES FOR THIOCARBAMATE HERBICIDES

David E. Schafer, and Albert J. Czajkowski, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 923,136, Jul. 10, 1978, Pat. No. 4,379,716, which is a continuation-in-part of Ser. No. 670,789, Mar. 26, 1976, abandoned. This application Feb. 14, 1983, Ser. No. 465,965
Int. Cl.³ A01N *57/10, 37/00*
U.S. Cl. 71—87 **34 Claims**

1. A method of reducing injury to grass crops by diallate or triallate herbicides which comprises applying to the soil, crop or crop seed an effective safening amount of a compound of the formula



wherein

a, b and c represent the integers zero or one, but cannot all be zero simultaneously;

W, X and Z independently represent oxygen or sulfur; provided that W, X and Z may not simultaneously equal oxygen;

R, R^1 and R^2 independently represent hydrogen, C_{1-13} alkyl, nitro lower alkyl, halo lower alkyl, lower alkenyl, halo lower alkenyl, lower alkynyl, halo lower alkylcarbonyl, halo lower alkenylsulfonyl lower alkyl, mono-lower alkyl amino, di-lower alkyl amino, halo lower alkenyl thio lower alkyl, lower mono- or di-alkyl amino carbonyl lower alkyl, lower mono- or di-alkyl aminothiocarbonyl, halophenylthio, para-aminosulfonyl phenyl, para-nitrobenzoyl, halophenylthio lower alkyl, phenyl, benzyl, naphthyl, naphthyl substituted by one or two lower alkyl or halo moieties, α-nitromethylbenzyl, α-methylbenzyl, phenyl substituted by one to three C_{1-13} alkyl, lower alkenyl, halo, NO_2, CN, CF_3 and CH_3S— moieties; and no more than one of R, R^1 and R^2 can be quinolyl, 1-pyridinyl lower alkyl, 5-chlorothiophene-2-lower alkyl and N-lower alkyl di-lower alkyl anilino carbonyl lower alkyl; provided that when a is zero, c is one and Z is sulfur, R^2 cannot equal hydrogen or halophenyl; phenyl cannot be substituted with NO_2 and CF_3 simultaneously; when X and W are oxygen and Z is sulfur R, R^1 and R^2 cannot simultaneously equal CH_3.

4,507,144

PLANT GROWTH METHOD AND COMPOSITION

Roni Aloni, Tel Aviv, Israel, assignor to Ramot University Authority For Applied Research And Industrial Development, Ltd., Ramat-Aviv, Israel

Filed Mar. 14, 1983, Ser. No. 475,212
Claims priority, application Israel, Apr. 1, 1982, 65402
Int. Cl.³ A01N *43/08, 37/38*
U.S. Cl. 71—89 **4 Claims**

1. A process for increasing the fiber crop of plants of the angiospermae families, selected from Hibiscus sp., Populus sp., Eucalyptus sp., Helianthus sp., Corchorus sp., and Boehmeria sp., cultivated for their fiber content, which comprises applying to said plants during the active period of the growth of the vegetative parts of the stem of the plants, a plurality of times at about weekly intervals, a composition consisting essentially of a fiber-increasing effective amount of a combination of the auxin NAA and the gibberellin GA_3 at a weight ratio of GA_3 to NAA of from 5:1 to 20:1 at a concentration in aqueous solution of from 5 to 20 mg/liter NAA and 50 to 200 mg/liter GA_3.

4,507,145

HERBICIDAL 3-[SUBSTITUTED 3- OR 5-ISOXAZOLYL]-1-4-, OR 5-SUBSTITUTED-2-IMIDAZOLIDINONES

Jerome M. Lavanish, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

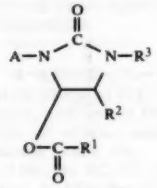
Continuation-in-part of Ser. No. 122,633, Feb. 19, 1980, Pat. No. 4,268,679. This application Nov. 18, 1980, Ser. No. 207,151

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[3] **A01N** *43/54;* **C07D** *233/02*

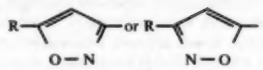
U.S. Cl. 71—092 **8 Claims**

1. A compound represented by the formula:

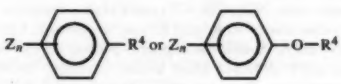


wherein:

A is

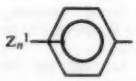


wherein R is alkyl or haloalkyl of up to 6 carbon atoms; cycloalkyl of from 3 to 8 carbon atoms; alkenyl or alkynyl of up to 5 carbon atoms; $—R^4—O—R^5$ or $—R^4—S—R^5$ wherein R^4 is alkylene of up to 6 carbon atoms and R^5 is alkyl of up to 6 carbon atoms; or



wherein Z is nitro, halogen, trifluoromethyl or R^5, and n is 0, 1, 2, or 3;

R^1 is alkyl or haloalkyl of up to 9 carbon atoms; cycloalkyl of from 3 to 8 carbon atoms; alkenyl or alkynyl of up to 5 carbon atoms, or



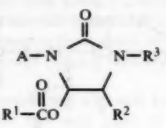
wherein Z^1 is nitro, halogen, trifluoromethyl, alkyl or alkoxy of up to 8 carbon atoms; and n is 0, 1, 2, or 3;

R^2 is hydrogen, hydroxy, alkyl of up to 4 carbon atoms, or allyl; and

R^3 is alkyl of up to 3 carbon atoms or allyl.

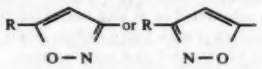
5. In a method of controlling weed growth wherein a herbicidally effective amount of a herbicide is applied to growth medium prior to emergence of weeds from or applied to the weeds subsequent to emergence from the growth medium, wherein the improvement resides in using as the herbicide a herbicidally effective amount of a compound or mixture of compounds defined in claim 1.

6. A compound represented by the formula:



wherein

A is



wherein R is hydrogen, alkyl or haloalky of up to 6 carbon atoms; cycloalkyl of from 3 to 8 carbon atoms; $—R^4—O—R^5$ or $—R^4—S—R^5$ wherein R^4 is alkylene of up to 6 carbon atoms and R^5 is alkyl of up to 6 carbon atoms;

R^1 is alkyl of up to 9 carbon atoms;

R^2 is hydrogen or alkyl of up to 4 carbon atoms; and

R^3 is alkyl of up to 3 carbon atoms.

4,507,146

2,4-DIAMINO-6-HALO-5-TRIFLUOROMETHYLPYRIMIDINES HAVING HERBICIDAL ACTIVITY

Hans Tobler, Allschwil, and Karl Hoegerle, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

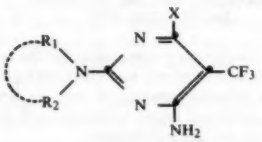
Filed Dec. 19, 1983, Ser. No. 562,660

Claims priority, application Switzerland, Dec. 28, 1982, 7588/82

Int. Cl.[3] **A01N** *43/48;* **C07D** *239/02*

U.S. Cl. 71—92 **9 Claims**

1. A 2,4-diamino-6-halo-5-trifluoromethylpyrimidine of the formula I



(I)

wherein

X is a halogen atom,

R_1 and R_2 independently of one another are each hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, or together form a C_3–C_7-alkylene bridge.

8. A method for selectively controlling weeds in crops of cultivated plants, which method comprises the pre-emergence treatment of the cultivated area or the post-emergence treatment of the crops with an effective amount of a pyrimidine compound according to claim 1.

4,507,147

Patent Not Issued For This Number

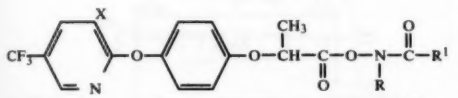
4,507,148

N-ACYL-N-ALKYL HYDROXYLAMINE ESTERS OF SUBSTITUTED PYRIDYLOXYPHENOXY PROPIONIC ACIDS AND HERBICIDAL METHODS OF USE

Charles G. Carter, San Francisco, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

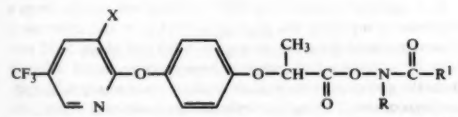
Filed Aug. 10, 1983, Ser. No. 521,860
Int. Cl.³ C07D *213/64*; A01N *43/40*
U.S. Cl. 71—94 21 Claims

1. An N-acyl-N-alkyl hydroxylamine ester of substituted pyridyloxyphenoxy propionic acid having the formula



wherein X is hydrogen or chlorine, R is selected from the group consisting of straight or branched chain lower alkyl groups having from 1 to 6 carbon atoms, cyclohexyl or benzyl or chlorine substituted benzyl and R^1 is an alkyl group having from 1 to 4 carbon atoms.

14. A method for controlling undesirable weed pests which comprises applying to the locus where control is desired a herbicidally effective amount of a compound having the formula



wherein X is hydrogen or chlorine, R is selected from the group consisting of straight or branched chain lower alkyl groups having from 1 to 6 carbon atoms, cyclohexyl or benzyl or chlorine substituted benzyl and R^1 is an alkyl group having from 1 to 4 carbon atoms.

4,507,149

DESULFURIZATION OF FLUID MATERIALS

D. Alan R. Kay, Burlington, Canada, and William G. Wilson, Pittsburgh, Pa., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 174,024, Jul. 31, 1980, Pat. No. 4,397,683, which is a continuation-in-part of Ser. No. 031,531, Apr. 19, 1979, and Ser. No. 838,888, Oct. 3, 1977, which is a continuation-in-part of Ser. No. 705,525, Jul. 15, 1976, Pat. No. 4,084,960, said Ser. No. 031,531, is a division of Ser. No. 838,945, Oct. 3, 1977, Pat. No. 4,161,400, which is a continuation-in-part of Ser. No. 705,525, Jul. 15, 1976, Pat. No. 4,084,960. This application Aug. 8, 1983, Ser. No. 521,751
Int. Cl.³ C21C *7/02*
U.S. Cl. 75—58 19 Claims

1. A method for decreasing the concentration of reactive sulfur in a fluid material, comprising reacting at least a portion of the sulfur with a compound containing a rare earth element, under reducing conditions.

4,507,150

REMOVAL OF IMPURITIES FROM MOLTEN ALUMINIUM

Ghyslain Dubé, Jonquiere, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Nov. 10, 1983, Ser. No. 550,753
Claims priority, application United Kingdom, Nov. 16, 1982, 8232661
Int. Cl.³ C22B *21/00*
U.S. Cl. 75—63 10 Claims

1. A process for the removal of dissolved Ti and V impurities from molten aluminium which comprises contacting a body of molten aluminium with a boron-bearing material in the presence of a metal chloride and/or fluoride material, active for fluxing (Ti, V)B_2, and agitating said molten aluminium under conditions effective to disperse said fluxing material in particle form through the body of molten aluminium, said boron-bearing material being added in amount sufficient to convert at least a major portion of the dissolved Ti and V impurities into insoluble (Ti, V)B_2 complex particles, the agitation of the molten metal being continued for a time sufficient, and said fluxing material being present in an amount effective, for collection of a major proportion of the complex diboride particles by the dispersed flux particles.

4,507,151

COATING MATERIAL FOR THE FORMATION OF ABRASION-RESISTANT AND IMPACT-RESISTANT COATINGS ON WORKPIECES

Wolfgang Simm, Ecublens, and Hans-Theo Steine, Chavannes, both of Switzerland, assignors to Castolin S.A., Saint-Sulpice, Switzerland

PCT No. PCT/EP81/00185, § 371 Date Jul. 23, 1982, § 102(e) Date Jul. 23, 1982, PCT Pub. No. WO82/01897, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 20, 1981, Ser. No. 403,620
Claims priority, application Switzerland, Dec. 5, 1980, 9000/80
Int. Cl.³ B22F *1/02*
U.S. Cl. 75—251 6 Claims

1. A flame spray powder composition for the thermal coating of workpieces comprising a mechanical mixture of hard particles of material and particles of a matrix-forming self-fluxing alloy selected from the group consisting of Ni-base, Fe-base and Co-base self-fluxing alloys,

said hard material being a fused tungsten carbide alloy consisting essentially by weight of about 3 to 7% C, from 0 to about 3% iron, up to about 2% total of other alloying elements and the balance essentially tungsten,

substantially each of said fused tungsten carbide alloy particles being characterized by a coating of about 2 to 20% by weight of a metal selected from the group consisting of Ni, Fe and Co having a melting point higher than the melting point of the self-fluxing alloy and having an average particle size less than about 75 microns,

the proportion by weight of the coated hard particles in the mixture ranging from about 10% to 95%, with the balance of the mixture essentially said self-fluxing alloy.

4,507,152

FUNGICIDAL AND INSECTICIDAL COMPOSITIONS FOR TREATING WOOD

Albert V. Collins, Fairview Park, and Richard W. Asmus, Lakewood, both of Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 416,101, Sep. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 386,659, Jun. 9, 1982, abandoned. This application Dec. 2, 1983, Ser. No. 557,770

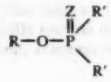
Int. Cl.³ C09D 5/16

U.S. Cl. 106—18.31 14 Claims

1. An aqueous composition having fungicidal and insecticidal properties comprising

(a) at least one oil-soluble metal salt of an organic carboxylic acid having fungicidal properties wherein the metal is zinc, chromium, iron, antimony, lead, mercury, or a mixture thereof, and

(b) at least one halopyridyl phosphate of the formula



FORMULA I

wherein R represents a halopyridyl group, Z represents oxygen or sulfur, and R' is independently a lower alkoxy, amino or lower alkylamino group,

(c) at least one surfactant, and

(d) from about 60 to 99% of water.

4,507,153

METHOD AND APPARATUS FOR THE HEAT TREATMENT OF A FINE GRAINED PRODUCT

Horst Herchenbach, Hennef; Albrecht Wolter, Cologne, and Eberhard Steinbiss, Düsseldorf, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 532,846

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237343

Int. Cl.³ C04B 7/44

U.S. Cl. 106—100 18 Claims

1. In a method for heat treating a largely calcined fine grained product consisting predominantly of lime wherein said product is heated in a heating assembly from a temperature of about 900° C. to a temperature of approximately 1250° C., the heated product is then sintered into clinker in a burning assembly, and then passed to a clinker cooler, the improvement whereby rapid heating and absorption of heat takes place in said heating assembly which comprises:

introducing a metered amount of heat into said heating assembly through a plurality of spaced points along said heating assembly.

4,507,154

CHLORIDE-FREE SETTING ACCELERATOR FOR HYDRAULIC BINDING AGENTS

Theodor Bürge, Geroldswil, and Eugen Bodenmann, Zurich, both of Switzerland, assignors to Sika AG, vorm. Kaspar Winkler & Co., Zurich, Switzerland

Filed Oct. 12, 1982, Ser. No. 433,799

Claims priority, application Switzerland, Oct. 12, 1981, 6513/81

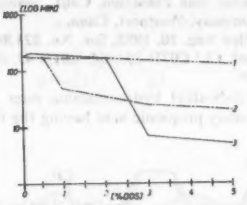
Int. Cl.³ C04B 7/35, 11/10, 13/21

U.S. Cl. 106—315 6 Claims

5. A chloride-free setting- and hardening-accelerator, wherein said accelerator contains at least 10% by weight of powdered aluminum hydroxide,

at least some to 90% by weight of at least one water soluble sulfate, nitrate or formate salt of calcium, magnesium, iron and aluminum, and

at least some to 30% by weight of at least one swellable polymer selected from the group consisting of methyl-, hydroxyethyl-, hydroxypropyl-, hydroxybutyl-, hydroxyethylmethyl-, hydroxypropylmethyl-, and hydroxybutylmethyl-cellulose, the sum of these accelerator ingredients totaling 100%.



4,507,155

CLEANING COMPOSITION AND METHOD

Robert H. Cheek, 1042 Buchanan St. NE., Washington, D.C. 20017

Filed Jul. 8, 1983, Ser. No. 511,960

Int. Cl.³ B08B 3/08; C11D 7/06, 7/24, 7/26, 7/30

U.S. Cl. 134—6 10 Claims

6. A method of removing dried printing ink residue from a substrate comprising the steps of applying to the substrate a cleaning composition consisting essentially of about 5–35 percent by volume of chlorinated hydrocarbon liquid selected from the group consisting of chloroform, carbon tetrachloride, trichloroethane, tetrachloroethane, pentachloroethane, trichloroethylene and perchloroethylene, about 5–35 percent by volume of a petroleum distillate selected from the group consisting of petroleum naphtha, mineral spirits, Stoddard solvent and ligroin, about 30–50 percent by volume of an aliphatic alcohol selected from the group consisting of methyl alcohol, ethyl alchol and isopropyl alcohol and about 10–40 percent by volume aqueous ammonia; and wiping away the cleaning composition and dissolved ink residue from the substrate.

4,507,156

CREEP RESISTANT DISPERSION STRENGTHENED METALS

Frederick K. Roehrig, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 9, 1984, Ser. No. 597,585

Int. Cl.³ B22F 3/24

U.S. Cl. 148—11.5 P 7 Claims

1. A method of improving the creep resistance of a thermomechanical processed creep resistant platinum-based alloy which comprises heating the alloy to a temperature not less than about 2800° F. for a period not less than about 6 hours.

4,507,157

SIMULTANEOUSLY DOPED LIGHT-EMITTING DIODE FORMED BY LIQUID PHASE EPITAXY

James D. Oliver, Jr., Charlottesville, Va., assignor to General Electric Company, Syracuse, N.Y.

Division of Ser. No. 261,584, May 7, 1981, abandoned. This application Feb. 9, 1984, Ser. No. 578,392

Int. Cl.³ H01L 21/208

U.S. Cl. 148—171 1 Claim

1. A method for making a gallium arsenide semiconductor light emitting diode, comprising

(a) providing a p-conductivity type substrate;

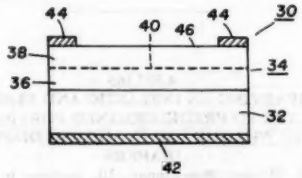
(b) providing a gallium arsenide melt including germanium for establishing p-conductivity and having a distribution co-efficient which increases with increasing temperature

and tellurium for establishing n-conductivity and having a distribution co-efficient which decreases with increasing temperature;

(c) adjusting the concentration of germanium and tellurium in said melt;

(d) heating said substrate and said melt to a temperature in excess of 860° C.;

(e) contacting said substrate and said melt; and



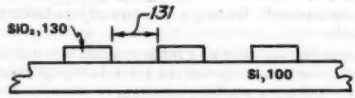
(f) decreasing said temperature at a controlled rate to below 400° C., to epitaxially grow an initial p-conductivity type layer of a desired thickness on said substrate in accordance with the concentration of germanium in said melt and a subsequent n-conductivity type layer of a desired thickness on said p-conductivity type layer in accordance with the concentration of tellurium in said melt.

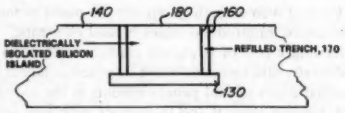
4,507,158

TRENCH ISOLATED TRANSISTORS IN SEMICONDUCTOR FILMS

Theodore I. Kamins; Donald R. Bradbury, both of Palo Alto, and Clifford I. Drowley, Mountain View, all of Calif., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Aug. 12, 1983, Ser. No. 522,767
Int. Cl.³ H01L *21/76, 21/95*
U.S. Cl. 148—175 **27 Claims**





1. A method for producing a semiconductor structure comprising the ordered steps of:

forming a first insulating layer over a semiconductor substrate;

removing a portion of said first insulating layer to form a first insulating region, said first insulating region being surrounded by an exposed region of said semiconductor substrate;

forming a semiconductor layer over said first insulating region to form an essentially flat surface substantially parallel to the surface of said semiconductor substrate;

removing a portion of said semiconductor layer over said first insulating region to form a trench region in said semiconductor layer, to expose a portion of the top surface of said first insulating layer, and to create an isolated island in said semiconductor layer;

forming a second insulating layer over the walls of said trench region extending from the essentially flat surface to the first insulating region so that said isolated island is completely surrounded by said first and second insulating layers; and

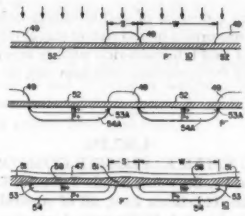
filling the remainder of said trench region with a solid material.

4,507,159

METHOD OF MANUFACTURING HIGH CAPACITY SEMICONDUCTOR CAPACITANCE DEVICES

Darrell M. Erb, Los Altos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 7, 1981, Ser. No. 309,359
Int. Cl.³ H01L *21/265*
U.S. Cl. 148—190 **25 Claims**



1. A method for manufacturing a charge storage region in a semiconductor substrate comprising:

forming an insulating layer on said substrate,

forming a masking layer over said insulating layer,

forming at least one aperture in said masking layer, said aperture at least partially defining a charge storage region in said semiconductor substrate,

implanting ions of a first polarity dopant through said aperture for diffusion through said substrate thereby forming a first polarity type region in said substrate;

implanting ions of a second polarity dopant through said aperture for diffusion through said substrate to a lesser degree than said first polarity dopant diffusion so that a second polarity type region is formed within said first polarity type region such that the diffusion of said first polarity dopant with respect to the diffusion of said second polarity dopant forms a first polarity type-second polarity type junction which is vertically aligned with and below the edge of said masking layer aperture such that said first polarity type-second polarity type junction defines the periphery of said charge storage region, and such that said first polarity type region isolates said second polarity type region from adjacent charge storage regions;

removing said masking layer and at least the portion of said first insulating layer exposed by said aperture; and

forming a second insulating layer on said substrate, such that said second insulating layer is partially formed by unremoved portions of said first insulating layer, and such that the ratio of the thickness of said second insulating layer including the unremoved portions of said first insulating layer to the thickness of said second insulating layer over said charge storage region is less than about two to one;

4,507,160

IMPURITY REDUCTION TECHNIQUE FOR MERCURY CADMIUM TELLURIDE

Jeffrey D. Beck, Plano; Herbert F. Schaake, Denton; John H. Tregilgas, Richardson, and Michael A. Kinch, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

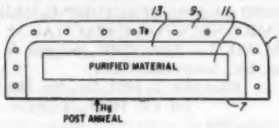
Filed Dec. 23, 1983, Ser. No. 564,871
Int. Cl.³ H01L *21/324, 21/385*
U.S. Cl. 148—191 **24 Claims**

1. A method of reducing the impurity level in impurity

containing mercury cadmium telluride, comprising the steps of:

(a) providing a slab of HgCdTe having impurities homogeneously distributed therein,

(b) causing mercury to be removed from the surfaces of said slab to cause the surface layer of said slab to be tellurium-rich,



(c) removing a portion of said tellurium-rich surface layer,

(d) causing impurities in said slab to travel into the remaining portion of said tellurium-rich surface layer and

(e) removing the remaining tellurium-rich surface layer from said slab.

4,507,161

NITRIC ESTER EXPLOSIVE COMPOSITIONS

Vladimir Sujansky, Burwood; Sergio Tribuzio, Tullamarine, and Jolanta Paull, Hawthorn East, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Feb. 2, 1984, Ser. No. 576,340
Claims priority, application Australia, Feb. 15, 1983, PF8039
Int. Cl.³ C06B *45/02*
U.S. Cl. 149—21 **34 Claims**

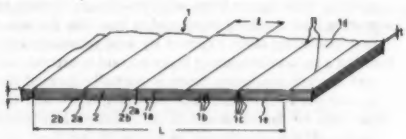
1. In a dynamite-type explosive composition wherein the essential explosive material comprises at least one liquid explosive nitric ester, the improvement whereby the amount of liquid explosive nitric ester in the composition is reduced without effecting the performance and physical properties of the composition, said improvement comprising including in said composition an emulsion component which comprises an oxygen-releasing salt phase, an organic fuel phase and an emulsifier.

4,507,162

GLUED LAMINATED WOOD AND METHOD OF MANUFACTURING THE SAME

Masakuni Iwamoto, Obu, Japan, assignor to Meinan Machinery Works, Inc., Obu, Japan

Filed May 16, 1983, Ser. No. 494,661
Int. Cl.³ B65H *29/66*
U.S. Cl. 156—157 **10 Claims**



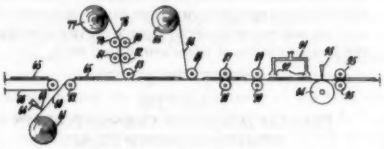
1. Method of manufacturing glued laminated wood comprising providing a plurality of unit veneer sheets, applying glue to said unit veneer sheets, laying up said unit veneer sheets in successively lapped relation in one direction of overlap, each of said unit veneer sheets having substantially the same length in the direction of said laying-up, the successive length intervals of overlap of each said unit veneer sheet on another in said direction of overlap each being nominally equal to said unit veneer sheet length minus the quotient determined by dividing said unit veneer sheet length by the number of plies to be in said glued laminated wood, and pressing and curing said laid-up veneer sheets to permanently deform and bond the same and thereby establish the thickness of said glued laminated wood, each of said deformed unit veneer sheets having a plurality of straight length portions and respective curved length portions between any two adjacent ones of its said straight length portions, said straight length portions being in tandem parallel relation to each other and successively displaced from each other in the direction of the thickness of said glued laminated wood by a distance substantially equal to the thickness of the immediately adjacent, lapped veneer sheet.

4,507,163

IMPARTING AN INELASTIC AND ELASTIC CHARACTER TO PREDETERMINED PORTIONS OF AN ELASTIC WEB FOR USE IN MAKING DISPOSABLE DIAPERS

Michael J. Menard, Bourbonnais, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Aug. 27, 1981, Ser. No. 296,934
Int. Cl.³ B32B *31/08*
U.S. Cl. 156—164 **9 Claims**



5. A method of intermittently attaching elastic members intermediate opposed waistband portions of absorbent panels contained in a continuously moving web of interconnected disposable diapers to form a pair of discrete elastic leg bands in each of said diapers from said web, said method comprising:

(a) continuously feeding a substantially inelastic substrate web;

(b) applying adhesive to a surface of said web substrate said adhesive being disposed in a substantially uniform pattern over the surface of said substrate;

(c) feeding spaced apart absorbent panel elements having wider opposing waistband portions and a narrowed central portion to the surface of said web carrying said adhesive, said web extending outside the panel elements along the entire longitudinal edges of said elements;

(d) feeding a pair of stretched elastic members to said web substrate, said members being disposed adjacent the longitudinal edges of said panel elements in the narrowed central portion thereof and in contact with said adhesive on said web substrate and said members overlying the wider waistband portions of said panel elements;

(e) feeding a second substantially inelastic web substrate to the upper surface of said panel elements, said second web being coterminous with said first web substrate and overlying said panel elements and said elastic members;

(f) applying pressure to said first and second web substrates along the peripheral portion of the first and second webs to secure said elastic member and to laminate said first and second web substrates;

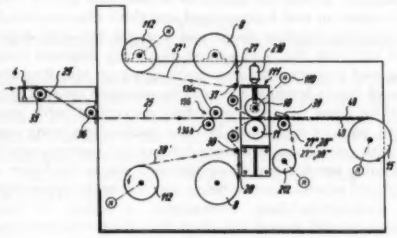
(g) treating at least a portion of the stretched elastic member that overlie wider waistband portions of the panel elements with a solvent for said elastic member to render said treated portions inelastic; and

(h) cutting said web substrates transversely between adjacent panel elements to produce a plurality of individual disposable diapers having a pair of discrete elastic leg bands.

4,507,164
METHOD AND APPARATUS FOR MAKING A FILAMENTARY WEB

Richard Pott, Lage/Lippe, Fed. Rep. of Germany, assignor to Aerotex Hochleistungsfaser GmbH, Krefeld, Fed. Rep. of Germany

Filed Aug. 11, 1982, Ser. No. 407,161
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132697
Int. Cl.³ B32B 5/12, 7/14
U.S. Cl. 156—177 31 Claims



1. A method of making filamentary webs, particularly from carbon-based, aramide-based, polyester-based and glass-based fibers, comprising the steps of

(a) forming an elongated band having a plurality of unidirectionally oriented, unconnected filaments;

(b) advancing said band through a working station;

(c) transporting elongated self-supporting connecting elements to said working station on a carrier, each of said connecting elements having a base strip and a coating of non-polymerizable dry adhesive on the base strip, and said carrier conveying said connecting elements into said working station in such a manner that said adhesive coatings face and said base strips extend transversely of said band;

(d) bonding said connecting elements to said band in said working station so that said connecting elements join said filaments and form a unitary filamentary web therewith, the bonding step being performed in the substantial absence of heat by pressing said dry adhesive coatings against said band; and

(e) separating the carrier from the connecting elements upon completion of the bonding step.

16. An apparatus for making filamentary webs, particularly from carbon-based, aramide-based, polyester-based and glass-based fibers, comprising:

(a) a first source of elongated band having a plurality of unidirectionally oriented, unconnected filaments;

(b) advancing means for advancing said band along a first path having a first working portion;

(c) a second source of a composite member including a flexible, elongated carrier, and elongated self-supporting connecting elements supported by said carrier, each connecting element having a base strip and a coating of non-polymerizable dry adhesive on the base strip;

(d) transporting means for transporting said composite member along a second path having a second working portion adjacent to said first working portion of said first path, said transporting means being arranged to convey said composite member into said second working portion in such a manner that the adhesive coatings of said connecting elements face and said base strips extend transversely of said band in said first working portion;

(e) contacting means adjacent to said first and second working portions for urging the adhesive coatings of said connecting elements into engagement with said band in the substantial absence of heat so that said connecting elements are bonded to said band thereby joining said filaments and forming a unitary filamentary web therewith; and

(f) means for separating the carrier from the connecting elements downstream of said working portions.

4,507,165
ELASTOMER INSULATION COMPOSITIONS FOR ROCKET MOTORS

Liles G. Herring, Waco, Tex., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 15, 1982, Ser. No. 418,311
Int. Cl.³ B29C 17/00
U.S. Cl. 156—191 14 Claims

1. A method of insulating a rocket motor, which comprises lining said rocket motor or portion thereof with non-asbestos elastomeric insulation material comprising:

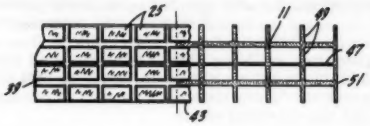
100 parts by weight of a crosslinked elastomer polymer;

between about 10 and 75 parts by weight of a char forming organic fiber selected from cotton flock, Sisal and a combination of cotton flock and Sisal.

4,507,166
METHOD OF MANUFACTURING STICK-ON PHOTOGRAPHS

Howard L. Posner, 30 Lakewood Dr., Highland Park, Ill. 60035

Filed Nov. 26, 1982, Ser. No. 444,808
Int. Cl.³ B44C 31/00
U.S. Cl. 156—235 4 Claims



1. A method of manufacturing adhesive backed photographs attached to an easily removable non-sticking backing sheet, including the steps of:

forming a pattern of sprocket holes at regular spaced intervals along the length of a roll of unexposed photographic print paper,

creating a plurality of latent photographic images on the roll of photographic print paper in a predetermined pattern with the pattern of images registered relative to the pattern of sprocket holes,

developing the latent photographic images on the roll of photographic paper to provide a roll of photographs arranged in a predetermined pattern on one side of the roll of paper,

feeding the roll of photographs into a cutter mechanism using the sprocket holes in the photographic paper to register the photographs relative to a cutter element of the cutter mechanism which cuts borders around each photograph,

applying the adhesive side of ah adhesive coated release sheet to the back of the roll of photographs after the roll of photographs has been registered relative to the cutter element, but before cutting of the borders by the cutter element,

cutting a border around each photograph with the cuts extending through the photographic paper and adhesive but not through the release paper, and

removing the border around each photograph from the roll of photographs.

4,507,167
PLATE CHANGING APPARATUS FOR OFFSET PRINTING MACHINES

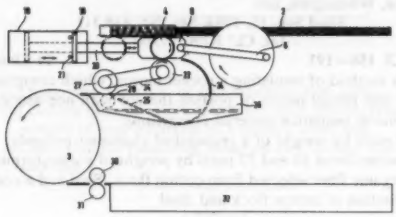
Hans-Joachim Jahme, Eckernfordestr. 1, 6200 Wiesbaden, and Harry Bracke, Trompeterstr. 40, 6200 Wiesbaden-Dambach, both of Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,247

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1982, 3239580

Int. Cl.[3] **C23F** *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—345 **8 Claims**



1. Printing plate changing apparatus for offset printing machines which include a form cylinder and an etchant or fixing bath, including a printing plate stacking table, plate individualizing means for withdrawing plates from the stacking table, and plate transporting and guiding means to transport and guide a fresh plate to be applied to the form cylinder from the individualizing means after having passed through the etchant or fixing bath to the form cylinder and to guide the used plate from the form cylinder to a depository, wherein in that the individualizing means comprises a rotatable vacuum roll disposed adjacent the partly open bottom surface of plate stacking table to engage the bottom surface of the stack, said vacuum roll having a shaft extending in parallel with the front edge of the plate stack and being adapted to be displaced linearly in parallel with the bottom of the stack, said fixing bath container being disposed directly underneath the stack of printing plates and said individualizing means.

4,507,168
METHOD FOR MOUNTING A FAUCET ON A PAPER CONTAINER AND APPARATUS THEREFOR

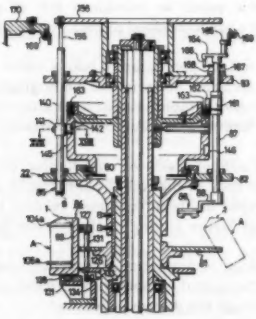
Yukio Konaka, Kanazawa, Japan, assignor to Shibuya Kogyo Co., Ltd., Kanazawa, Japan

PCT No. PCT/JP81/00038, § 371 Date Oct. 25, 1982, § 102(e) Date Oct. 25, 1982, PCT Pub. No. WO82/02852, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 27, 1981, Ser. No. 440,216

Int. Cl.[3] **B27G** *11/02;* **B32B** *31/24*

U.S. Cl. 156—379.8 **7 Claims**



1. An apparatus for affixing a faucet on a container, wherein the faucet and the container have surfaces which can be bonded together by heat welding, comprising: a stationary base; a first, rotary disc mounted on said base for rotation about a vertical axis; a series of container-holding mechanisms mounted in circumferentially spaced positions on said first disc, each of said container-holding mechanisms comprising an upright, main body of substantially U-shaped cross section for holding a container therein, pivot means supporting said main body for pivotal movement about a horizontal axis extending transversely through the upper portion of said main body, and means for effecting pivotal locations of said container-holding mechanisms at selected locations as said first disc is rotated with respect to said base; second and third discs mounted on said base for rotation about said vertical axis and disposed above said first disc, said second disc being disposed directly above said container-holding mechanisms on said first disc, a series of faucet-holding mechanisms mounted on said second and third discs for vertical sliding movement with respect thereto, each of said faucet-holding mechanisms being associated with one of said container-holding mechanisms, said faucet-holding mechanisms being disposed below the lower surface of said second disc and being opposed to the upper ends of said container-holding mechanisms; a series of heaters mounted on said second and third discs for pivotal movement about a vertical axis and for vertical sliding movement, each of said heaters being associated with one of said container-holding mechanisms and one of said faucet-holding mechanisms, each of said heaters comprising a main heater body and first and second heating elements mounted on oppoxite sides of said main heater body, said first heating element facing downwardly toward its associated container-holding mechanism and being effective for heating a surface of a container held in that container-holding mechanism, said second heating element facing upwardly toward its associated faucet-holding mechanism and being effective for heating a surface of a faucet held in that faucet-holding mechanism; cooperating cam tracks on said base and cam follower means on said container-holding mechanisms, said faucet-holding mechanism and on said heaters so that as said discs rotate in unison with each other with respect to said stationary base, the surfaces of the faucet and the container in each of the work stations will be heated by said first and second heating elements, then said first and second heating elements will be moved out of the way and then the heated surface of the faucet will be pressed against the heated surface of a container whereby to fuse the surfaces together.

4,507,169
METHOD AND APPARATUS FOR VAPOR PHASE GROWTH OF A SEMICONDUCTOR

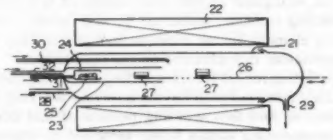
Masaharu Nogami, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 25, 1982, Ser. No. 392,074

Claims priority, application Japan, Jun. 29, 1981, 56-101087

Int. Cl.[3] **C30B** *25/10;* **B05D** *5/12;* **C23C** *13/04*

U.S. Cl. 156—606 **6 Claims**



1. A method for vapor phase epitaxial growth of a semiconductor multilayer film having a high-resistance layer and a low-resistance layer on a semiconductor substrate in a vapor phase growth apparatus having a first reaction tube and a second reaction tube which is arranged in the first reaction tube, said method comprising the steps of:

forming the high-resistance layer on the semiconductor substrate under a diffusion controlled condition within the

second reaction tube, which has a temperature gradient region therein, in which a source material is placed, into which a reaction gas and a carrier gas are fed, and in which the semiconductor substrate is placed at the temperature gradient region; and

forming the low-resistance layer on the high-resistance layer under a kinetically controlled condition within the first reaction tube in which the semiconductor substrate is placed outside the second reaction tube at a constant temperature region and into which a gas containing a doping agent and a carrier gas are fed.

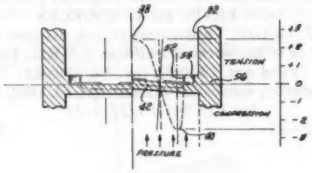
4,507,170
OPTIMIZED STRESS AND STRAIN DISTRIBUTION DIAPHRAGMS

Kjell E. Myhre, 941 Enterprise Ave., Inglewood, Calif. 90302

Division of Ser. No. 110,024, Jan. 7, 1980, Pat. No. 4,376,929, which is a division of Ser. No. 1,310, Jan. 5, 1979, abandoned, which is a division of Ser. No. 754,251, Dec. 27, 1976, Pat. No. 4,133,100. This application Sep. 17, 1982, Ser. No. 419,352

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—633 **63 Claims**



14. In a method of making a transducer diaphragm, the improvement comprising in combination the steps of:

providing a recess in said diaphragm encompassed by a circumferential edge region of said diaphragm;

providing a promontory projecting from said edge region into said recess and being integral with said diaphragm; and

bonding a strain gauge to said diaphragm in coincidence with said promontory.

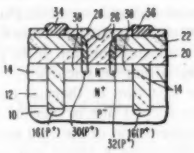
4,507,171
METHOD FOR CONTACTING A NARROW WIDTH PN JUNCTION REGION

Harsaran S. Bhatia; Satyapal S. Bhatia, both of Wappingers Falls; Jacob Riseman, Poughkeepsie, and Emmanuel A. Valsamakis, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,844

Int. Cl.[3] **H01L** *21/306, 7/44;* **B44C** *1/22;* **B05D** *5/12*

U.S. Cl. 156—643 **15 Claims**



1. A method for making contact to a narrow width PN junction region comprising:

providing a monocrystalline semiconductor body whose at least surface region is of a first conductivity;

forming an insulating layer on said surface region;

forming a conductive layer over said insulating layer;

etching regions of said conductive layer and said insulating layer down to said silicon body to form substantially horizontal surfaces and substantially vertical surfaces on the layered structure;

forming a conformal conductive layer over said substantially horizontal surfaces and said substantially vertical surfaces;

etching said conformal conductive layer to substantially remove said horizontal layer and to provide a narrow dimensioned vertical conductive layer upon said substantially vertical surfaces and said silicon body;

forming an insulator over said conductive layer and said vertical conformal conductive layer;

heating said body and said layered structure at a suitable temperature to cause dopant of a second conductivity to diffuse into said body from said vertical conformal conductive layer to form said narrow width PN junction region; and

forming an electrical contact to said conductive layer through said insulator which effectively makes electrical contact to said narrow width PN junction region through said conductive layer and said vertical conformal conductive layer.

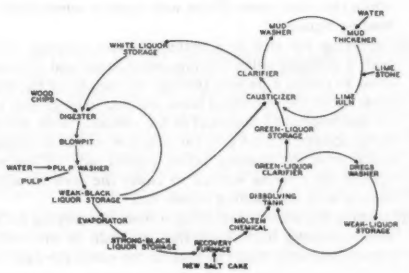
4,507,172
KRAFT PULPING PROCESS

Michael S. Steltenkamp, Pensacola, Fla., assignor to St. Regis Paper Company, New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,749

Int. Cl.[3] **D21C** *11/12*

U.S. Cl. 162—30.11 **17 Claims**



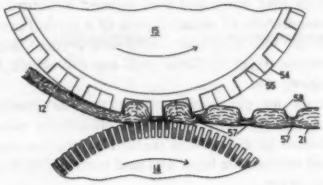
1. In the process of producing kraft cooking liquor for addition to a digester for enhancement of the yield derived from kraft pulping of wood chips in which black liquor obtained from washing digested pulp is concentrated and burned, the resulting smelt is dissolved in water and the resulting green liquor is causticized with a calcium salt to produce a white liquor for use in digestion, the steps of treating at least a part of the black liquor by the direct addition thereto of a calcium salt or base in the presence of air to generate solublized calcium ions and, polysulfide ions in an amount sufficient to increase the pulp yield, and returning the treated black liquor to the digester.

14. An improved kraft cooking liquor for digestion of wood chips which comprises a mixture of a white pulping liquor and a black liquor treated according to the method of claim **1** to provide polysulfide and calcium ions.

4,507,173
PATTERN BONDING AND CREPING OF FIBROUS PRODUCTS

Bernard G. Klowak, Neenah, Wis., and Nilo I. Salmeen, Jr., deceased, late of Neenah, Wis. (by Lorraine J. Salmeen, personal representative), assignors to James River-Norwalk, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 182,834, Aug. 29, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,294
Int. Cl.³ D21H *5/24*
U.S. Cl. 162—112 **19 Claims**



1. A process for bonding and enhancing the bulk of a highly bulked low strength fibrous web, comprising the steps of:

(a) passing a highly bulked, low strength fibrous substrate web, which has low internal fiber bonding such that creping of the substrate will tend to separate and fluff up the fibers, into a nip between a gravure roller and an impression roller, the impression roller having a resilient surface with raised areas defining an interconnected network and depressed areas between the raised areas such that the web is compressed under the raised areas of the impression roller and the remainder of the web is left substantially uncompressed, the height of the raised areas above the depressed areas selected to be greater than the uncompressed thickness of the substrate web, the gravure roller having depressions which carry binding liquid in a pattern which underlies and registers with the raised areas on the impression roller such that binding liquid is absorbed substantially through the compressed areas of the web while the other areas of the web receive substantially no binding liquid;

(b) applying the web to a heated, moving creping surface with a pressure roller having raised areas and depressed areas to define a pattern therein, the height of the raised areas above the depressed areas selected to be greater than the uncompressed thickness of the substrate web, the web being compressed only by the raised areas of the pressure roller with the binding liquid coated side of the web against the creping surface to cause the web to adhere thereto with the binding liquid; and

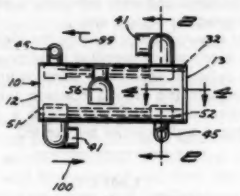
(c) creping the web by removing it from the creping surface with a creping blade such that the bulk of the web so creped is greater than the bulk of the substrate web.

4,507,174
TIRE PYROLIZING

Wolfgang A. Kutrieb, P.O. Box 43, Rte. 2, Chetek, Wis. 54728

Filed May 10, 1983, Ser. No. 493,258
Int. Cl.³ C10B *7/14*
U.S. Cl. 202—97 **17 Claims**

1. A pyrolytic apparatus for pyrolytically decomposing tires and the like into pyrolytic gas and oil and other by-products, comprising a closed metal vessel having a door for access to the interior thereof, a refractory lining mounted in the vessel to define a gas-oil separation chamber between the vessel and the said lining the reactor chamber and having an inlet and an outlet, means exterior of the vessel and fluidly connected to the heat exchanger inlet for supplying heat to the heat exchanger, means fluidly connected to the heat exchanger outlet for conducting exhaust heat exterior of the vessel and means fluidly connected to the vessel for conducting the pyrolytic gas and oil from the gas-oil separation chamber to a location exterior of the vessel, said refractory lining having a passage means for the

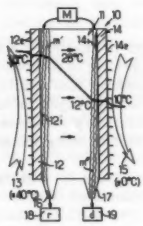


pyrolytic gas and oil to flow from the reactor chamber to the separation chamber.

4,507,175
FRACTIONAL DISTILLATION PROCESS AND APPLICATIONS THEREOF TO THE PRODUCTION OF THERMAL OR MECHANICAL ENERGY FROM TWO LOW LEVEL HEAT SOURCES

Pierre Y. J. Le Goff, Vandoeuvre, France, assignor to Centre National de la Recherche Scientifique C.N.R.S., France

Filed Apr. 29, 1983, Ser. No. 490,042
Claims priority, application France, Apr. 30, 1982, 82 07510
Int. Cl.³ B01D *1/22, 3/28*
U.S. Cl. 203—27 **23 Claims**



1. A process for separating and fractionating a starting solution having a composition comprising at least two components, namely a more volatile solvent and a less volatile solute, into two solutions of different compositions, namely a residue solution having a decreased solvent and enriched solute concentration and a distillate solution having an enriched solvent and decreased solute concentration, comprising at least one operation stage including the steps of:

separating the first and second films of the starting solution by causing them to trickle down through a single closed enclosure, the closed enclosure being substantially void of air and maintained at a pressure close to the boiling vapor pressure of the starting solution at the particular temperature prevailing within the enclosure;

maintaining the first film in thermal contact with a cold source and the second film in thermal contact with a hot source, the temperatures of the cold and hot sources being respectively substantially lower and substantially higher than the particular temperature prevailing within the enclosure, the first film thereby becoming enriched in solvent to constitute the distillate solution and the second film thereby obtaining a reduced solvent concentration to constitute the residue solution; and

collecting the enriched solvent distillate solution and the reduced solvent residue solution at the base of the enclosure.

4,507,176

SEPARATION OF N-BUTYL ACETATE FROM N-BUTANOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

Filed May 7, 1984, Ser. No. 608,071
Int. Cl.[3] B01D *3/40*; C07C *67/48*
U.S. Cl. 203—51 2 Claims

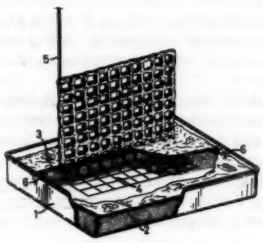
1. A methdd for recovering n-butyl acetate from a mixture of n-butyl acetate, n-butanol and water which comprises distilling a mixture of n-butyl acetate, n-butanol and water in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure n-butyl acetate and water as overhead product and obtaining the extractive agent and n-butanol from the stillpot or reboiler, the extractive agent comprises at least acetamide.

4,507,177

METHOD OF STABILIZATION OF PARTICULATE MATERIAL

Roger Duckworth, Guildford; Roy A. Johnson, Worplesdon, and Timothy E. Lester, Hampton, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Oct. 20, 1983, Ser. No. 543,892
Claims priority, application United Kingdom, Oct. 29, 1982, 8230984
Int. Cl.[3] C25B *1/00*; C25D *9/08*
U.S. Cl. 204—1 R 14 Claims



1. A method of stabilizing particulate material located beneath naturally occurring water comprising the steps of (a) placing a first electrode below the surface of the particulate material, (b) positioning a second electrode in electrical relationship with the first electrode and (c) passing an electrical current between the electrodes for a sufficient time to cause dissolved salts in the water to deposit on or between the first electrode and the interface of the particulate material and the water.

4,507,178

ELECTRODEPOSITION OF CHROMIUM AND ITS ALLOYS

Donald J. Barclay, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,515
Claims priority, application United Kingdom, Feb. 9, 1982, 8203765
Int. Cl.[3] C25D *5/34*
U.S. Cl. 204—29 26 Claims

1. A process for electroplating chromium, comprising the step of:

pretreating the surface of a part to be plated with chromium, by forming a deposit of a sulphur compound thereon, which sulphur compound subsequently accelerates the reduction of chromium ions to chromium metal; and

the subsequent step of electroplating chromium on said pretreated surface from an electrolyte containing trivalent chromium ions.

4,507,179

PROCESS OF PRODUCING ALUMINUM SUBSTRATE FOR MAGNETIC RECORDING MEDIA

Koichi Yoshida; Yoshio Hirayama; Yasuo Oka, and Takashi Kajiyama, all of Shizuoka, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 584,995
Int. Cl.[3] C25D *11/08, 11/10*
U.S. Cl. 204—58 6 Claims

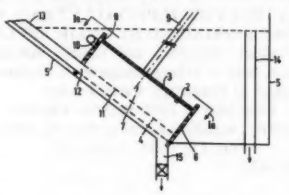
1. A process of producing an aluminum substrate for magnetic recording media, which comprises subjecting an aluminum material to an electrolytic treatment by a constant voltage process at an electrolytic voltage higher than 60 volts using an aqueous solution of 1.5 to 15% by weight chromic acid as the electrolyte at an operating temperature of 30°–50° C.

4,507,180

METHOD OF ELECTRODEPOSITING A HOMOGENEOUSLY THICK METAL LAYER, METAL LAYER THUS OBTAINED AND THE USE OF THE METAL LAYER THUS OBTAINED, DEVICE FOR CARRYING OUT THE METHOD AND RESULTING MATRIX

Bernardus T. van der Werf, and Gustaaf H. A. van der Hoorn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,791
Claims priority, application Netherlands, Mar. 14, 1983, 8300916
Int. Cl.[3] C25D *1/10, 17/00*
U.S. Cl. 204—5 12 Claims



1. A method for the electrodeposition of a homogeneously thick metal layer on the surface of a substantially flat substrate in which an anode and the substrate as cathode are placed opposite to each other in an electrolyte bath and an apertured screening member is present between the planes of the anode and the cathode, characterized in that a screening member is formed of an electrically insulating material which screening member has the shape of a cylinder whose axis is perpendicular to the cathode and is furthermore positioned so that a slot-shaped aperture remains exposed between the cathode and the screening member, the dimension of the slot-shaped aperture being small as compared with the size of the aperture of the screening member.

4,507,181

METHOD OF ELECTRO-COATING A SEMICONDUCTOR DEVICE

Prem Nath, Rochester; Timothy J. Barnard, Lake Orion, and Dominic Crea, Mt. Clemens, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

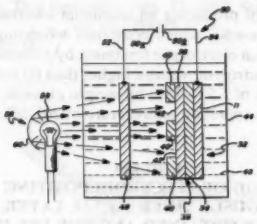
Filed Feb. 17, 1984, Ser. No. 581,499
Int. Cl.[3] C25D *5/02, 5/10, 7/12*
U.S. Cl. 204—15 32 Claims

1. An improved method of electro-coating a preselected pattern upon a first surface of a semiconductor device, said semiconductor device including photoresponsive junction means disposed between the first surface and a second surface thereof, the method including the step of:

disposing said semiconductor device in an electro-coating apparatus which includes an electrolyte bath;

illuminating said semiconductor device for activating the photoresponsive junction means; and

providing electrical current, from a source external to said semiconductor device, to the second surface of said semi-



conductor device, said activated photoresponsive junction means providing for the flow of electrical current from the second surface through said photoresponsive junction and to the first surface of said semiconductor device, whereby a pattern electro-coated deposit is formed upon the first surface of the semiconductor device without damaging said photoresponsive junction thereof.

4,507,182

PROCESS FOR PREPARING METAL BY ELECTROLYSIS, ESPECIALLY LEAD, AND BY-PRODUCT OBTAINED BY THEIR APPLICATION

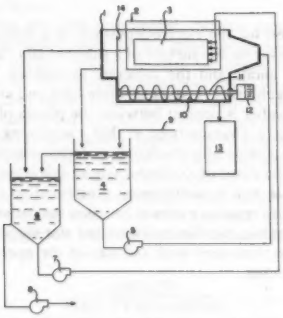
Claude Palvadeau, Breuillet, and Claude Scheidt, Issy-les-Moulineaux, both of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France

Filed May 6, 1983, Ser. No. 492,443

Claims priority, application France, May 6, 1982, 82 07940

Int. Cl.³ C25C *1/12, 1/18*

U.S. Cl. 204—35.1 **16 Claims**



1. Process of preparation of a lead or copper metal by electrolysis in a cell having a cathode and an anode which are separated by a diaphragm, comprising the steps of:

preparing an electrolyte containing said lead or copper metal chloride to be prepared and at least one chloride of an alkali metal or alkaline-earth metal, and

circulating the electrolyte between said cathode and said anode, parallel to the surface of said cathode, the surface of said cathode being arranged in a substantially vertical direction and the surface of said cathode having a sufficiently low density of sites of nucleation so that the metallic particles which are formed from said sites keep their individually vis-a-vis the adjacent particles, until said particles reach a dimension of at least about 100 micrometers;

maintaining the flow of the electrolyte the length of the surface of the cathode in a laminary or weakly turbulent manner so that, under the action of their weight and of the forces exercised by the current of the electrolyte, said metallic particles are detached and fall into the electrolyte, and

removing the metallic particles grouped at the bottom of the cell.

4,507,183

RUTHENIUM COATED ELECTRODES

Robert C. Thomas; Robert D. Caldwell, and Douglas E. Doner, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 3, 1983, Ser. No. 500,687

Int. Cl.³ C25B *1/14*

U.S. Cl. 204—98 **21 Claims**

1. A method comprising:

(a) electroplating a ruthenium metal onto at least a working portion of a cathode adapted to be used in an electrolytic cell with an anode, a cathode, a separator in between the anode and cathode, adapted to permit alkali metal ions to be transported therethrough from the anode to the cathode, said cathode electroplated with a nonacidic ruthenium-containing solution including a dissolved reaction product of:

(i) a salt of the complex $[Ru_2N(H_2O)_2X_8]^{3-}$ where X represents either a chlorine or a bromine, and

(ii) an acid or the anion of such acid in aqueous solution and an electrolyte;

(b) installing said cathode in the electrolytic cell, and

(c) passing a direct current from the anode to the cathode such that a halogen and an alkali metal hydroxide is produced.

4,507,184

METHOD FOR FINISHING MATTED SURFACE ON A METAL-MADE ARTICLE FOR PERSONAL ORNAMENT

Toshio Murata, Tokyo; Hachiro Kushida, Saitama, and Kenji Irie, Kanagawa, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,298

Claims priority, application Japan, Nov. 16, 1983, 58-215701

Int. Cl.³ C25F *3/16*

U.S. Cl. 204—129.35 **1 Claim**

1. A method for finishing a matted surface of a metal-made article for personal ornament which comprises the steps of:

(a) forming a first matted surface with fine protrusions and recesses on the article by honing or barrel finishing;

(b) forming a hardened layer on the matted surface by nitriding, carbonizing, boriding or oxidizing;

(c) partially removing the hardened layer covering the protrusions on the matted surface by a first electrolytic or chemical polishing;

(d) forming a second matted surface on the article by honing or barrel finishing; and

(e) partially removing the surface layer at the protrusions by a second electrolytic or chemical polishing to smoothen the surface leaving a sandy appearance.

4,507,185

PHOTOGENERATION OF ACTIVE FORMATE DECOMPOSITION CATALYSTS FROM TRANSITION METAL COMPLEXES CONTAINING MANGANESE AND THE PRODUCTION OF HYDROGEN

Allen D. King, Jr.; R. Bruce King, both of Athens, Ga., and Donald E. Linn, Jr., Chicago, Ill., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Oct. 25, 1983, Ser. No. 545,407
Int. Cl.³ B01J 19/12
U.S. Cl. 204—157.1 R 23 Claims

1. A process for producing hydrogen from formate and water wherein an active formate decomposition catalyst is photogenerated from a transition metal complex having a formula $RMn(CO)_3$ wherein R is selected from the group consisting of an aromatic group and a substituted aromatic group using near ultraviolet light under oxygen free conditions at a temperature of 45° C. and above in the presence of formate and water.

4,507,186

DIANHYDRIDES AND POLYIMIDES

Tayseer S. Nimry, Wheaton, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 294,345, Aug. 19, 1981, Pat. No. 4,362,859. This application Jun. 10, 1982, Ser. No. 387,046
Int. Cl.³ C07D 307/77
U.S. Cl. 204—158 R 1 Claim

1. A process for the manufacture of bicyclo(4.2.0)octane-7,8-dimethyl-3,4,7,8-tetracarboxylic acid dianhydride which comprises reacting equimolar amounts of dimethyl-maleic anhydride and cis-4-cyclohexene-1,2 dicarboxylic anhydride in the presence of benzene wherein the reaction is irradiated by light.

4,507,187

SILOXANE PHOTOINITIATORS WITH ARYOYL FORMATE GROUPS

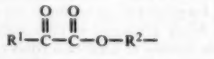
Anthony F. Jacobine, Meriden, Conn., and Samuel Q. S. Lin, Edgewater, N.J., assignors to Loctite Corporation, Newington, Conn.

Filed Apr. 19, 1984, Ser. No. 601,871
Int. Cl.³ C08F 2/46
U.S. Cl. 204—159.13 13 Claims

1. An organopolysiloxane photoinitiator comprising an average of at least 2 siloxane units, of which at least an average of one siloxane unit per organosiloxane molecule has the formula:

$$X_aR_bSiO_{(4-a-b)/2}$$

wherein X denotes an aryoyl formate group of the formula:



R is hydrocarbyl or halogen substituted hydrocarbyl of from 1–10 carbon atoms; a is an integer from 1–3, b is an integer from 0–2, a+b=1–3; R^1 is aryl or substituted aryl; and R^2 is a divalent hydrocarbon group of from 3–10 carbon atoms.

7. A composition comprising a photoinitiator of claim 1 and an organopolysiloxane with photocurable functionality.

4,507,188

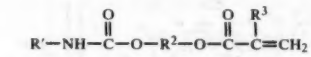
ULTRAVIOLET CURABLE FORMULATIONS CONTAINING URETHANE ACRYLATE MONOMERS

Yuan C. Chu, East Windsor, N.J., assignor to Thiokol Corporation, Chicago, Ill.

Filed Dec. 21, 1983, Ser. No. 564,816
Int. Cl.³ C08G 18/10, 18/00; C08F 120/36
U.S. Cl. 204—159.23 16 Claims

1. A radiation-curable coating composition, comprising:

A. from about 25% to about 95% by weight of an oligomeric polyethylene adipate linked to terminal acrylate moieties by toluene urethane linkages, and B. from about 5% to about 75% by weight of a reactive diluent having the formula:



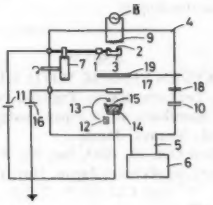
wherein R' is a monovalent aromatic or alkyl radical including from 4 to about 20 carbon atoms, R^2 is a divalent alkyl radical including from about 2 to about 4 carbon atoms, and R^3 is hydrogen or methyl.

4,507,189

PROCESS OF PHYSICAL VAPOR DEPOSITION

Yoshihiko Doi; Yoshiki Maeda, and Mitsunori Kobayashi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 30, 1981, Ser. No. 316,906
Claims priority, application Japan, Nov. 6, 1980, 55-156584
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 N 13 Claims



1. A process for physical vapor deposition which comprises coating at least one compound selected from the group consisting of carbides, nitrides or oxides of metals belonging to IVb, Vb and VIb groups of the Periodic Table, aluminum oxide and zirconium oxide or a solid solution consisting of said compounds on the surface of a substrate, wherein said surface prior to coating is subjected to sputter cleaning in an atmosphere of hydrogen or a gaseous mixture of hydrogen and inert gas wherein hydrogen is present at 20% by volume or more, to increase and homogenize the adhesive strength of said coating of said compound or said solid solution on said substrate.

4,507,190

HORIZONTAL-PASS ELECTROTREATING CELL

Edward C. Brendlinger, Pitcairn; Richard F. Higgs, Monroeville, and Issa J. Kharouf, Pittsburgh, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 425,762, Sep. 28, 1982,. This application Aug. 8, 1983, Ser. No. 521,476
Int. Cl.³ C25D 17/00, 17/10
U.S. Cl. 204—206 6 Claims

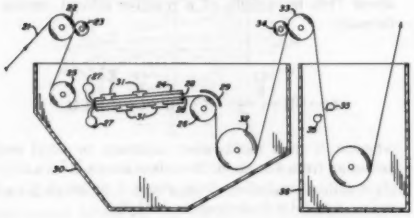
1. In an apparatus for the electrotreating of an extended length of metal strip comprising,

a tube-like electrolyte corridor for the passage of electrolyte

therethrough, said tube-like corridor being supported with its axis substantially horizontal,

means for directing the strip into the inlet of said corridor, means for directing the strip from the outlet of said corridor, means for supplying an electrotreating current to said strip, means for flowing electrolyte into and out of said corridor and means for carrying the electrolyte exiting from said corridor to an electrolyte tank,

the improvement, in which said means for supplying an electrotreating current include electrodes inserted into holes in the corridor walls and insertable from the outer



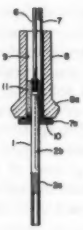
surface of said walls, the outer wall surface in proximity to such electrodes being free from contact by the electrolyte, said electrodes (i) having an outer flange portion for exerting a liquid-tight sealing force against the corridor wall outer surface and (ii) an inner portion inserted into said wall holes, such that when so inserted (a) the inner electrode face will be in parallel opposition to a strip face and substantially flush with the corridor wall inner surface and (b) the vertical electrode surface immediate to said inner electrode face is in liquid-tight engagement with the hole surface surrounding it.

4,507,191

OXYGEN SENSOR WITH HEATER

Akio Ebizawa, Iwakura; Kazuo Taguchi, Nagoya, and Toshio Okumura, Kagamihara, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Oct. 25, 1983, Ser. No. 545,180
Claims priority, application Japan, Nov. 17, 1982, 57-200443
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—427 **2 Claims**



1. An oxygen sensor with heater, comprising:

a hollow electrolyte oxygen sensor element having a closed end and an open end;

an inner and an outer electrode on the sensor element;

a hollow ceramic heater, disposed within the sensor element and spaced therefrom, formed as a unitary body by sintering and embedding a metallized pattern ending with terminal patterns in a hollow, substantially cylindrical ceramic insulator;

a tubular insulator adjacent the open end of the sensor element;

a lead connected to the inner electrode and extending through the tubular insulator; and

connecting terminals, extending within said tubular insulator, brazed to said terminal patterns of the ceramic heater to form brazed terminal portions;

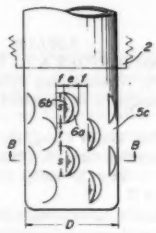
wherein the lead for the inner electrode and the brazed terminal portions are tightly secured by sealing with a heat-resistant ceramic bonding agent within said tubular insulator, and the hollow ceramic heater provides a communication passageway to the inside of the sensor element for a reference gas.

4,507,192

OXYGEN SENSOR FOR EXHAUST GAS OF INTERNAL COMBUSTION ENGINE

Akio Ebizawa, Iwakura, and Hisaharu Nishio, Tokai, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 342,815, Jan. 26, 1982, abandoned. This application Jan. 12, 1984, Ser. No. 569,936
Claims priority, application Japan, Jun. 1, 1981, 56-84668
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—428 **3 Claims**



1. An oxygen sensor for exhaust gas of an internal combustion engine comprising:

a solid electrolyte tube having a bottom at one bottom end thereof, a reference-gas-side inner electrode coated on the inner surface of said solid electrolyte tube so as to be kept in contact with fresh air, an object-gas-side outer electrode coated on the outer surface of said electrolyte tube so as to come in contact with the exhaust gas, a metallic housing tube holding said solid electrolyte tube and allowing exposure of said outer bottom surface thereof to the exhaust gas, a metallic protective tube coaxially extending from one end of an annular shelf of said housing tube so as to surround the bottom of said solid electrolyte tube, a plurality of holes bored through the sidewall of said protective tube so as to have convex arcuate edges relative to one common circumferential direction of the protective tube, and a plurality of lugs being bent at said holes toward the inside of said protective tube so as to form chords at feet of the thus bent lugs, the chords facing said arcuate edges, each of said holes and said lugs being similarly oriented relative to the protective tube, each of said lugs being equally bent toward the inside of the protective tube by the same angle of 40° to 70° relative to a tangential plane to the circumference of said protective tube at said chord defined by the foot of said lug so as to deflect flow of the exhaust gas inwardly in a transverse circumferential direction relative to the longitudinal direction of the electrolyte tube, said holes being arranged in two matrices, each of said two matrices having at least two rows of the holes with inter-row spacings in the longitudinal direction of the protective tube and at least four columns of the holes with inter-column spacings in the circumferential direction of the protective tube, the holes of one of said two matrices being interposed among the holes of the other one of said two matrices and being longitudinally and circumferentially offset therefrom, the holes of one of

the two matrices being offset from the holes of the other one of the two matrices in the longitudinal direction of the solid electrolyte tube by one half of said longitudinal inter-row spacing of each matrix and in the circumferential direction of the solid electrolyte tube by one half of said circumferential inter-column spacing of each matrix, and said holes satisfying the following conditions:

$s=(1/5 \text{ to } 2/5)D$,

$e=(\frac{1}{8} \text{ to } 1)s$,

$t=(\frac{1}{4} \text{ to } 4/3)s$, and

$f=(\frac{1}{4} \text{ to } \frac{1}{3})s$,

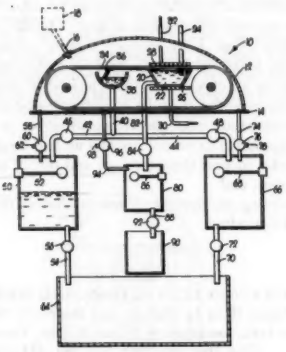
wherein "s" is the length of said chord, "D" is the outside diameter of said protective tube, "e" is a distance from said chord to the apex of said arcuate edge, "t" is the longitudinal inter-row spacing between adjacent rows of the holes in each of said matrices, and "f" is the circumferential spacing between the nearest two holes.

4,507,193

MECHANISM FOR RECOVERING AND COLLECTING EXTRACTED POLAR LIQUIDS

Arthur S. King, 8021 Cherokee, Leawood, Kans. 66206

Filed Aug. 6, 1984, Ser. No. 637,885
Int. Cl.³ B03C *5/02*
U.S. Cl. 204—302 **5 Claims**



1. In combination with apparatus for extracting polar liquids from solution, said apparatus including a receptacle for such liquids and a vacuum chamber housing said receptacle and connectable to a source of negative pressure for maintaining the area within said chamber at a pressure level below atmospheric pressure, mechanism for recovering and collecting liquid from said receptacle comprising:

a container;

a drain line leading from said receptacle to said container;

a drain valve in said line operable when open to open said line and when closed to close said line;

a vacuum line leading from said housing to said container;

a pressure valve in said vacuum line operable when open to communicate the housing with the container whereby to equalize the pressures therein and operable when closed to prevent communication between the housing and the container and to communicate the container with the atmosphere; and

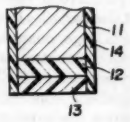
discharge means coupled with the container and operable when open to permit discharge of collected liquid from the container and operable when closed to prevent said discharge.

4,507,194

REFERENCE ELECTRODE

Takeshi Shimomura; Shuichiro Yamaguchi, both of Kawasaki; Norihiko Ushizawa, Honmachi, and Noboru Oyama, Higashikurume, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,354
Claims priority, application Japan, Aug. 2, 1982, 57-134883
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—435 **14 Claims**



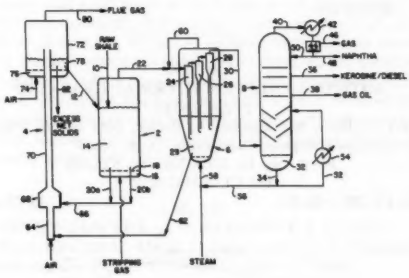
1. A reference electrode, comprising a conductive substrate having a metallic silver surface and a layer of a silver complex polymer compound on the silver surface of said conductive substrate, wherein said silver complex polymer compound is prepared by forming a complex between a polymer compound containing a coordination nitrogen atom and a silver ion.

4,507,195

COKING CONTAMINATED OIL SHALE OR TAR SAND OIL ON RETORTED SOLID FINES

Byron G. Spars, Mill Valley; Robert J. Klett, San Francisco, and P. Henrik Wallman, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 16, 1983, Ser. No. 495,297
Int. Cl.³ C10G *1/00, 9/32*
U.S. Cl. 208—11 R **8 Claims**



1. An improved process for retorting a raw particulate hydrocarbonaceous solid comprising both coarse and fine particles to recover pyrolysis oil of a lower average molecular weight and containing reduced contamination, said hydrocarbonaceous solid being selected from the group consisting of oil shale and tar sand, the process comprising;

(a) mixing, at the top of a vertical retorting vessel designed to control gross vertical backmixing, the raw particulate hydrocarbonaceous solid with a hot particulate heat-transfer material comprising combusted, pyrolyzed hydrocarbonaceous solids to raise the raw hydrocarbonaceous solid to a temperature sufficient to pyrolyze the hydrocarbons therein;

(b) passing the mixture of step (a) downward through a pyrolysis stage while retaining it in the stage for a time sufficient to decompose a significant amount of the raw hydrocarbonaceous solid to yield hydrocarbon vapors, and whereby fine particles comprising primarily at least partially pyrolyzed hydrocarbonaceous solid are also formed;

(c) passing a stripping gas through the mixture in the pyroly-

sis stage at a rate sufficient to significantly lower the dew point of the evolved hydrocarbon vapors and to entrain the fine particles in the pyrolysis zone;

(d) recovering from the top of the pyrolysis stage a mixture of contaminated hydrocarbon vapors, stripping gas, and entrained fine particles;

(e) withdrawing, from the bottom of the pyrolysis stage, a mixture of retorted particulate hydrocarbonaceous solids and the heat-transfer material;

(f) separating at least some of the fine particles from the contaminated hydrocarbon vapors and stripping gas and introducing said fine particles into a coking stage, separate from the pyrolysis stage, comprising a fluidized bed;

(g) condensing from the contaminated hydrocarbon vapors at a temperature between 550° F. and 680° F. a high-boiling fraction containing concentrated contaminants, said high-boiling fraction comprising at least 90% hydrocarbons having a boiling point above 850° F.;

(h) contacting the contaminated high-boiling fraction with the fine particles contained in the coking stage, which fine particles consist essentially of the fine particles formed in step (b) and separated in step (f), at a temperature between about 850° F. and 975° F., whereby the high-boiling fraction is thermally cracked in contact with the fine particles to produce oil vapors and the contaminants are deposited along with coke on the fine particles;

(i) withdrawing the product oil vapors having a lower average molecular weight and having substantially reduced contamination compared to the high-boiling fraction from the coking stage;

(j) withdrawing coked fine particles from the coking stage;

(k) combusting the coked fine particles of step (j) and the mixture of solids of step (e) in a combustion stage to form a hot particulate heat-transfer material; and

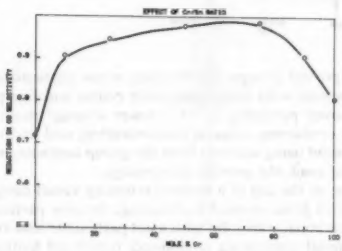
(l) recirculating at least a portion of the material of step (k) to step (a).

4,507,196

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Larry E. Reed, and Randall A. Porter, both of c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Aug. 16, 1983, Ser. No. 523,540
Int. Cl.³ C10G 9/16
U.S. Cl. 208—48 AA **18 Claims**



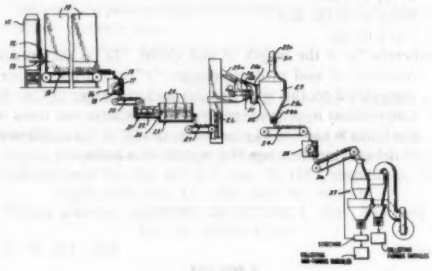
1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a combination of tin and elemental chromium or an organic compound of chromium, a combination of antimony and elemental chromium or an organic compound of chromium and a combination of tin, antimony and elemental chromium or an organic compound of chromium.

4,507,197

APPARATUS AND METHOD FOR PRODUCING SHOT-FREE MINERAL WOOL

Alan R. Koenig, and Edward L. Moon, both of St. Petersburg, Fla., assignors to Jim Walter Corporation, Tampa, Fla.

Filed Aug. 9, 1982, Ser. No. 406,424
Int. Cl.³ B07B 9/02
U.S. Cl. 209—2 **14 Claims**



1. A dry method of de-shotting shot-containing mineral wool fibers such as that obtained from a blow room floor comprising the steps of:

(a) subjecting said mineral wool fibers to a nodulating means to compact said fibers into entangled nodules comprising fibrous and non-fibrous particles,

(b) passing said nodules through an air classifying means to open up said nodules and separate fibrous particles of said nodules from a by-product mainly consisting of non-fibrous particles, wherein said air classifying means comprises an air classifier whose classifying chamber includes a rotor adapted both (i) to subject air-entrained fibrous nodules inside said classifying chamber to a centrifugal force, and (ii) to permit opened up and de-shotted fibrous particles to pass therethrough and out of said classifying chamber, and

(c) collecting the opened up and de-shotted fibrous particles and by-product.

4,507,198

FLOTATION COLLECTORS AND METHODS

Kim N. Unger; Rory L. Tibbals, and Dennis V. Smeltzer, all of Tucson, Ariz., assignors to Thiotech, Inc., Tucson, Ariz.

Filed Dec. 20, 1982, Ser. No. 451,011
Int. Cl.³ B03D 1/14
U.S. Cl. 209—166 **4 Claims**

1. A collector for use in concentrating metal values in ores by flotation, said collector comprising a mixture of (A) an O-alkyl N-alkylthionocarbamate wherein each alkyl radical has from 1 to 6 carbon atoms and (B) at least 30 percent by weight of (A) of a normally liquid tall oil fatty acid fraction.

4,507,199

OIL FILTER UNIT AND SEALING DEVICE

Robert W. Carlisle, 26216 Parana, Houston, Tex. 77080

Filed Apr. 27, 1983, Ser. No. 488,989
Int. Cl.³ B01D 27/00
U.S. Cl. 210—238 **4 Claims**

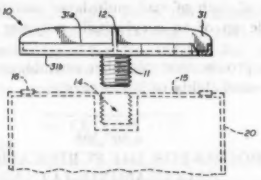
1. A throw away protective cap in combination with a screw-on type oil filter unit including a generally cylindrical housing having first and second ends and wherein said first end is characterized by means defining an oil passage, said oil passage including threaded means therein for threadably receiving the throw away protective cap, said cap comprising:

a flat plate like member having an upper surface and a lower surface;

said upper surface characterized by means for facilitating the

application of force thereon for inducing manual rotation of said cap;

said lower surface of said cap constituting a seal for abutting said oil filter unit and for sealingly engaging said filter unit to preclude the escape of oil contained therein;



attachment means characterizing the lower surface of said plate and axially aligned with the aforesaid threads of said oil filter unit; and

the threads of said oil filter unit and the said attachment means of said cap being appropriately dimensioned to cause seating of said cap on said oil filter unit to seal same while securely locking said cap to the filter unit itself.

4,507,200

FLUID FILTER CARTRIDGE AND METHOD OF ITS CONSTRUCTION

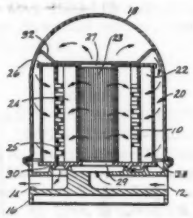
Paul J. Meissner, Sun Valley, Calif., assignor to Meissner Manufacturing Company, Inc., Sun Valley, Calif.

Continuation of Ser. No. 288,339, Jul. 30, 1981, abandoned, and a continuation of Ser. No. 160,906, Jun. 18, 1980, Pat. No. 4,317,727. This application Jan. 9, 1984, Ser. No. 569,261

The portion of the term of this patent subsequent to Mar. 2, 1999, has been disclaimed.

Int. Cl.³ B01D *27/06*

U.S. Cl. 210—315 **10 Claims**



1. A filter cartridge comprising:

an inner annular element;

an outer annular element concentrically spaced from the inner element to form an annular region at least one of the elements comprising a pleated filter;

an annular spacer insert concentrically disposed in the annular region;

a first annular retaining member with covering one end of the first and second annular elements and the annular region; and

a second annular retaining member covering the other end of the inner and outer annular elements openings being formed in the second retaining member to provide an exit from the annular region, the improvement characterized in that the spacer insert is a single-ply tubular body with a sidewall, perforations formed in the sidewall to permit transverse flow through the body from the pleated filter to the annular region and protrusions extending transversely from the sidewall to permit longitudinal flow through the annular region, the sidewall and the protrusions together serving as the spacer.

4,507,201

TUBE PRESSURE FILTER

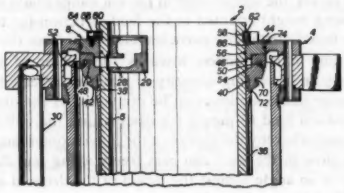
George W. Wall, Par, and Glyn T. Jones, St. Austell, both of England, assignors to English Clays Lovering Pochin & Company, Ltd., Cornwall, England

Filed Feb. 2, 1984, Ser. No. 576,112

Claims priority, application United Kingdom, Feb. 7, 1983, 8303305

Int. Cl.³ B01D *29/10*

U.S. Cl. 210—232 **10 Claims**



1. A tube pressure filter comprising:

an inner assembly;

a generally tubular outer assembly which surrounds the inner assembly to provide between the assemblies an annular chamber;

an impermeable diaphragm which is disposed within the outer assembly to divide the annular chamber into inner and outer compartments;

a filter element disposed within the inner compartment;

means for supplying a mixture of a liquid and a particulate solid to the inner compartment; and

means for supplying fluid under pressure to the outer compartment so as to cause the liquid in the inner compartment to be forced through the filter element leaving the particulate solid material deposited on the filter element, the inner assembly comprising a core and two end sections, at least one of the end sections comprising an annular member which is a sliding fit on the core, and a retaining device which engages the core and provides an abutment preventing displacement of the annular member off the end of the core, the end section also comprising releasable locking means maintaining the retaining device in engagement with the core.

4,507,202

DEVICE FOR THE SEPARATION OF A LIQUID

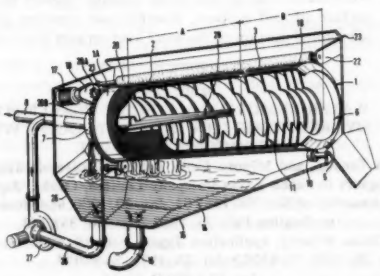
Dan Nord, Bärs Lid 42, 446 00 Älvängen, and Ingvar Johansson, Vårvindsgatan 49, 417 12 Göteborg, both of Sweden

Filed Jan. 13, 1983, Ser. No. 457,563

Claims priority, application Switzerland, Jan. 18, 1982, 8200232; Jan. 18, 1982, 8200233

Int. Cl.³ B01D *33/10*

U.S. Cl. 210—391 **7 Claims**



1. An apparatus for separating a liquid from a sludge or from a liquid containing particles, comprising: a rotatable drum having a jacket with openings for discharge of liquid, an inlet

device at one end of the drum for the supply of sludge or liquid containing particles into said drum, the inlet device being formed by a duct having an open chute-like structure provided with an end wall blocking liquid flow and flanges extending along both sides of said chute-like structure for flow of liquid from said chute over said flanges, said chute-like structure and flanges extending a substantial distance into said drum, a screw element in said drum for the forward feed of sludge or liquid containing particles, said screw element having a portion extending along at least the whole longitudinal extension of the duct inside the drum and essentially perpendicular to the inside of the jacket, the screw element having flange blade sections of increasing height counted in the feed direction for the sludge or the liquid containing particles, measured from the jacket of the drum in a direction towards the center of the drum whereby an increasing quantity of material collected between the flange blade sections can be conveyed in the direction of the forward feed to means for discharging the collected medium, and whereby the sludge or the liquid containing particles which flow in the duct can pass freely along said flanges for supply at an angle against the jacket of the drum at a distance from the bottom of the drum.

4,507,203

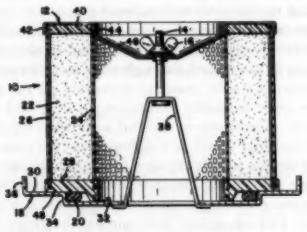
FILTER ELEMENT

Gordon L. Johnston, Maple Grove, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Mar. 14, 1983, Ser. No. 475,206

Int. Cl.³ B01D *27/08, 46/24*

U.S. Cl. 210—445 **4 Claims**



1. A filter element for cleaning fluids, said filter element being compressed by an axial load with fastening means holding said filter element to a top surface of a support, said filter element comprising:

a non-structural cylindrical filter medium having inner and outer sides;

first and second caps at opposite ends of said filter medium, said first cap including a metallic retainer, said metallic retainer having a bottom surface;

a structural member on a first side of said filter extending from the bottom surface of the metallic retainer to the top surface of said support, wherein said member carries a substantial portion of the axial load on said filter element.

4,507,204

WATER-REMOVING MATERIAL USABLE FOR HYDROPHOBIC LIQUIDS AND PROCESS FOR PRODUCING THE SAME

Koji Tanaka, and Minoru Ueda, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Continuation of Ser. No. 116,781, Jan. 30, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,363

Claims priority, application Japan, Feb. 12, 1979, 54-15786; Jun. 29, 1979, 54-83002; Jul. 23, 1979, 54-94077

Int. Cl.³ B01D *39/16*

U.S. Cl. 210—497.01 **12 Claims**

1. A tubular water-removing filter usable for removing water from hydrophobic liquids, comprising an internal tubular support having a plurality of perforations, and, wound around said tubular support, a fiber assemblage containing multi-layer water-swellable fibers, at least a part of the fiber outer layer of each of said multi-layer water-swellable fibers being made up of a hydrophilic, cross-linked polymer, and the remainder of each of said multi-layer water-swellable fibers being made up of an acrylonitrile polymer and/or another polymer,

with the proviso that said fiber assemblage has a degree of water-swellability of 2–100 cc/g.

4,507,205

PROCESS FOR THE PURIFICATION OF GLUCOSAMINOGLUCANS

Pietro Cremonesi, and Giancarlo Sportoletti, both of Milan, Italy, assignors to Italfarmaco S.P.A., Milan, Italy

Filed Feb. 25, 1981, Ser. No. 237,880

Claims priority, application Italy, Feb. 29, 1980, 20314 A/80; Feb. 9, 1981, 47754 A/81

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—638 **2 Claims**

1. The process of fractionation of sodium heparinate wherein sodium heparinate of U.I. 155/mg of anticoagulant activity is subjected to ultrafiltration with a membrane having a cut-off at 10,000, and the material recovered from the portion which does not go through the membrane, after lyophilization exhibits anticoagulant activity of 193 U.I./mg., and anti X_a activity of 78 U.I./mg, whereas the corresponding activities of the permeate are less than 100 U.I./mg and, respectively, 180 U.I./mg.

4,507,206

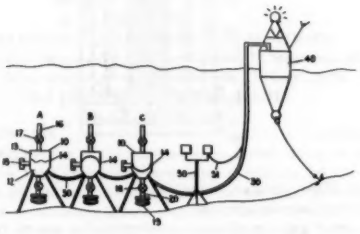
METHOD FOR RESTORING AND MAINTAINING EUTROPHIED NATURAL BODIES OF WATERS

Geoffrey F. Hughes, 260 Hodenpyl Dr. SE., Grand Rapids, Mich. 49506

Filed Jul. 19, 1982, Ser. No. 399,898

Int. Cl.³ C02F *1/58*

U.S. Cl. 210—709 **10 Claims**



1. A method of restoring and maintaining a eutrophied natural body of water such as a lake by inactivating the phosphorus ions present in the lake and in the watershed area comprising an initial takedown phase, if necessary, and a final takedown and maintenance phase, said initial phase comprising the addition to the lake of about a stoiciometric amount of a primary phosphate precipitant until the phosphate concentration is reduced to about 0.100 mg/l.; followed by said final phase which comprises placing one or more automatic dispensers containing a secondary phosphate precipitant in the anoxic regions of the lake and in the sources of water flow into said lake in the watershed area and adjusting the flow of said secondary precipitant to a level which will reduce the level of said phosphorus ions in said lake to and maintain it at a concentration of about 0.010 mg/l. or less.

4,507,207

PROCESS FOR THE CHEMICAL REMOVAL OF PHOSPHORUS COMPOUNDS FROM WASTE WATER

Cornelis W. Verhoeve, and Cornelis A. M Weterings, both of Stein, Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 510,682, Jul. 5, 1983, abandoned, which is a continuation of Ser. No. 293,328, Aug. 17, 1981, abandoned, which is a continuation of Ser. No. 162,448, Jun. 24, 1980, abandoned. This application Jun. 21, 1984, Ser. No. 623,226
Claims priority, application Netherlands, Jun. 30, 1979, 7905111
Int. Cl.³ C02F 1/52
U.S. Cl. 210—714 16 Claims

1. A non-impeller driven fluidized bed process for chemically removing phosphate waste compounds from waste water containing the same consisting essentially in the combination of steps of:

(a) forming in a reactor a fluidized bed of solid, water-insoluble finely divided metal phosphate particles with a non-impeller driven flow of waste water introduced thereinto at a rate sufficient to thereby maintain fluidization of said particles while insufficient to entrain and remove said particles from said reactor, and incluing a water-soluble metal compound in the waste water flow in the reactor, said metal compound being reactive with said phosphate waste compounds to form precipitated solid water-insoluble metal phosphate compounds, the amount of said metal compound being at least about stoichiometric with respect to the amount of said phosphate waste compound, in a said waste water flow;

(b) treating said waste water by passing the same through said fluidized bed of finely-divided metal phosphate particles;

(c) maintaining sufficient waste water residence time in said reactor and fluidized bed to effect essentially complete reaction between said phosphate waste compounds and said water-soluble metal compound, to form and precipitate said solid metal phosphate compound in the presence of said fluidized bed whereby a thus-formed precipitate collects on said solid fluidized particles; and

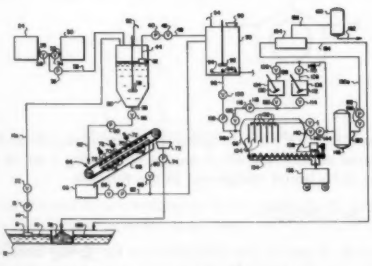
(d) removing the thus-treated and dephosphatized waste water as effluent from said reactor, while avoiding entraining solids therewith.

4,507,208

PROCESS FOR HANDLING WASTE FROM OIL WELL OPERATIONS

Jules A. Simon; John A. Young; Michael D. Ford, and Harold C. Bourgeois, all of Baton Rouge, La., assignors to Drilling Waste, Incorporated, Baton Rouge, La.

Filed Jun. 30, 1983, Ser. No. 509,715
Int. Cl.³ C02F 1/52
U.S. Cl. 210—721 10 Claims



1. A process for separating drilling mud and waste materials which comprises mixing the drilling mud and waste materials with a flocculating agent, allowing the mixture of flocculating agent and drilling mud and waste materials to separate into a first clarified liquid phase and a phase containing flocculated solids, separating said first clarified liquid phase from said phase containing flocculating solids, placing said phase containing flocculated solids on an inclined surface to allow liquid to drain from said flocculated solids, collecting and storing the thus dewatered flocculated solids, collecting liquid from said inclined surface which has drained from said dewatered flocculated solids, combining the thus collected liquid with said first clarified liquid phase to produce a second clarified liquid phase, filtering said second clarified liquid phase to produce a filtrate stream and separating said clarified liquid phase to produce substantially pure water and a liquid phase containing dissolved solids.

4,507,209

DESTABILIZATION OF SLUDGE WITH HYDROLYZED YAM STARCH FLOCCULANTS

Raymond N. Yong, Beaconsfield, and Amar J. Sethi, Baie D'Urfe, both of Canada, assignors to Suncor, Inc., Toronto, Canada

Filed Dec. 16, 1983, Ser. No. 562,353
Int. Cl.³ C02F 1/54, 11/14
U.S. Cl. 210—728 5 Claims

1. In the process for the destabilization of colloidal sludge suspensions containing clay minerals or metal oxides-hydroxides, by treatment of said suspensions with an effective amount a flocculating reagent to substantially separate water from suspended solids, the improvement wherein the flocculating reagent is a hydrolyzed yam starch obtained by the aqueous hydrolysis of the starch in the presence of about 10 to 30 gms per 100 gms of starch of insoluble metal salts formed in situ, wherein the salts employed during the hydrolysis to form said insoluble salts are the soluble salts of metals selected from the group consisting of sodium, potassium, ammonium, magnesium, calcium, and aluminum, and respective anions of said soluble salts are selected from the group consisting of sulfates, acetates, chlorides, nitrates, chlorates, bromides, iodides, thiocyanates, and phosphates and wherein the yam starch is obtained from a yam selected from the group of Cocoa Yam, Negro Yam and Sweet Yam.

4,507,210

METHOD OF DETERMINING THE OPTIMUM AQUEOUS COMPOSITION FOR PREVENTING THE SWELLING AND DISPERSION OF SUBTERRANEAN FORMATION PARTICLES

Rodrigue V. Lauzon, Taylor Lake Village, Tex., assignor to Venture Innovations, Inc., Lafayette, La.

Filed Jun. 13, 1983, Ser. No. 503,625
Int. Cl.³ C09K 7/00
U.S. Cl. 252—8.5 A 9 Claims

1. A method of formulating an aqueous medium to minimize the swelling and dispersion of subterranean formation particles contacted by said medium which comprises:

(a) exposing said particles to aqueous solutions containing various concentrations of a compound which inhibits the swelling or dispersion of shales;

(b) measuring the capillary suction time of said exposed particles in said solutions;

(c) determining the concentration range of said compound sufficient to minimize the capillary suction time of said exposed particles;

(d) immersing said particles in aqueous solutions having a pH in the range from about 8 to about 13;

(e) measuring the capillary suction time of said immersed particles in said solutions;

(f) determining the pH range sufficient to minimize the capillary suction time of said immersed particles; and

(g) utilizing said concentration range of said compound and said pH range to formulate said aqueous medium.

4,507,211

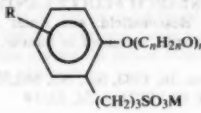
OIL RECOVERY METHOD UTILIZING AN ALKYLPHENYL ETHER PROPANE SULFONATE

Carter G. Naylor, and David R. McCoy, both of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Sep. 24, 1982, Ser. No. 423,414
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D 18 Claims

1. A process for recovering petroleum from a subterranean petroleum bearing formation penetrated by an injection well and a production well which comprises:

(a) injecting into the formation via the injection well a drive fluid comprising water having dissolved therein about 0.05 to 5.0 wt. % of a surface active agent having the general formula:



wherein r is an alkyl or dialkyl of from 4 to 25 carbon atoms, n is an integer of from 2 to 4, m is an integer of from 1 to 50; and M is a cation;

(b) forcing the fluid through the formation; and

(c) recovering petroleum through the production well.

4,507,212

NITRILE COMPOUNDS AS OIL FIELD BIOCIDES

Dennis E. Dria, Austin, Tex.; Noel J. Bremer, Kent, Ohio; Myra A. Dria, Austin, Tex., and Rodger W. McKain, Chagrin Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 15, 1982, Ser. No. 441,874
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D 9 Claims

1. A process for inhibiting the growth of sulfate reducing bacteria in water used for flooding oil-containing reservoirs, the process comprising introducing into said sulfate reducing bacteria containing water a quantity of acrylonitrile sufficient to at least inhibit the growth of the sulfate reducing bacteria.

4,507,213

METHOD FOR OBTAINING GELLED HYDROCARBON COMPOSITIONS, THE COMPOSITIONS ACCORDING TO SAID METHOD AND THEIR APPLICATION IN THE HYDRAULIC FRACTURING OF UNDERGROUND FORMATIONS

Gerard Daccord, Saint Etienne; Richard Lemanczyk, St. Heand, and Claude Vercaemer, Sorbiers, all of France, assignors to Etudes et Fabrication Dowell Schlumberger, France

Filed Dec. 23, 1982, Ser. No. 452,709
Claims priority, application France, Dec. 29, 1981, 81 24653
Int. Cl.³ E21B *43/26*
U.S. Cl. 252—8.55 R 29 Claims

1. In the method of obtaining a gelled hydrocarbon composition by mixing a solution of alkyl orthophosphate esters activated by aluminum with the hydrocarbon, the improvement which comprises employing as the aluminum, an aqueous solution of a partially neutralized aluminum acid salt of the formula:

$$Al_n(OH)_mX_p$$

wherein X is halide, hydrogenosulfate, sulfate, dihydrogenophosphate or acetate, (pxq)+m=3n where q is the valence of the anion, the ratio of 100m/3n being between 30 and 80, the aqueous solution having a pH of more than 1.5 to a pH of 4.

4,507,214

RARE EARTH HALIDE GREASE COMPOSITIONS

Henry E. Aldorf, Paris, France, assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 2, 1983, Ser. No. 548,224
Int. Cl.³ C10M *5/04*
U.S. Cl. 252—18 29 Claims

1. A lubricating composition comprising a major amount of a lubricating grease and a minor amount of a rare earth metal halide.

4,507,215

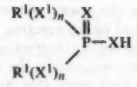
PHOSPHORUS-CONTAINING METAL SALT/OLEFIN COMPOSITIONS AND REACTION PRODUCTS OF SAME WITH ACTIVE SULFUR

Calvin W. Schroeck, 873 E. 331st St., Eastlake, Ohio 44094

Filed Apr. 25, 1983, Ser. No. 488,569
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E 46 Claims

1. A composition comprising:

(A) a metal salt of (A)(I) at least one acid of the formula



wherein each X and X^1 is independently oxygen or sulfur, each n is zero or one, and each R^1 is independently the same or different hydrocarbon based group, and (A)(II) at least one carboxylic acid of about 2 to about 40 carbon atoms, the ratio of equivalents of (A)(I) to equivalents of (A)(II) being in the range of about 0.5:1 to about 1:0; and

(B) an olefinically unsaturated compound capable of reacting with active sulfur, the ratio of equivalents of component (A) to equivalents of component (B) being in the range of about 1000:1 to about 1:5.

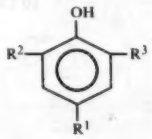
4,507,216

HINDERED PHENYL ESTERS OF CYCLIC BORATES AND LUBRICANTS CONTAINING SAME

Milton Braid, Haddonfield, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,951
Int. Cl.³ C10M *1/10, 3/02, 7/02;* C09F *5/08*
U.S. Cl. 252—49.6 24 Claims

1. A reaction product prepared by reacting (1) a hindered phenol of the formula



wherein R^1 is a C_1 to C_{30} hydrocarbyl group and R^2 and R^3 are the same or different alkyl groups containing 4 to 18 carbon atoms, (2) a boron compound of the formula

$$(RO)_p(BO_2)_qZ_rY$$

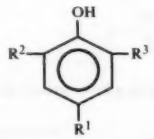
where R, Y and Z are selected from the group consisting of hydrogen and a C_1 to C_6 alkyl group, p and r are 0 to 2 and q is 1 to 3 and (3) a carboxylate ester of the formula

$$R^4(OCOR^5)_n(OH)_t$$

wherein R^4 is a hydrocarbyl group containing 3 to 6 carbon

atoms, R^5 is a hydrocarbyl group containing 6 to 25 carbon atoms, n is 1 to 3 and t is 2 or 3.

5. A lubricant or liquid fuel composition comprising a major amount of a lubricating oil or grease therefrom or of a liquid fuel and an antifriction, antioxidant or fuel consumption reducing amount of reaction product prepared by reacting (1) a hindered phenol of the formula



wherein R^1 is a C_1 to C_{30} hydrocarbyl group and R^2 and R^3 are the same or different alkyl groups containing 4 to 18 carbon atoms, (2) a boron compound of the formula

$$(RO)_p(BO_2)_qZ_rY$$

were R, Y and Z are selected from the group consisting of hydrogen and a C_1 to C_6 alkyl group, p and r are 0 to 2 and q is 1 to 3 and (3) a carboxylate ester of the formula

$$R^4(OCOR^5)_n(OH)_t$$

wherein R^4 is a hydrocarbyl group containing 3 to 6 carbon atoms, R^5 is a hydrocarbyl group containing 6 to 25 carbon atoms, n is 1 to 3 and t is 2 or 3.

4,507,217

MAGNETIC COMPOSITIONS AND MAGNETIC MEMORY DEVICES PREPARED THEREFROM

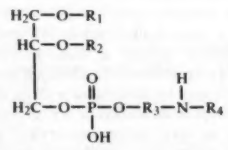
Barry D. Sears, Marblehead, Mass., assignor to Lipid Specialties, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 472,481, Mar. 7, 1983, which is a continuation-in-part of Ser. No. 284,675, Jul. 20, 1981, Pat. No. 4,426,330. This application May 12, 1983, Ser. No. 493,928

Int. Cl.³ C04B *35/04;* **C07F** *9/02*

U.S. Cl. 252—62.54 **16 Claims**

1. In a magnetic composition suitable for use in preparing magnetic memory devices, which magnetic composition comprises finely-divided magnetic particles, a dispersing agent for the magnetic particles and a solvent, the improvement which comprises employing as the dispersing agent a synthetic phospholipid having the structural formula:



wherein R_1 and R_2 are hydrogen or acyl radicals, R_3 is a polymethylene radical and R_4 is a long-chain polymer radical which provides an

or an N-C bond.

4,507,218

HEAT STORAGE MEANS

David A. Nuttle, 1316 Ravenhurst Dr., Raleigh, N.C.

Filed Apr. 4, 1983, Ser. No. 481,773

Int. Cl.³ C09K *5/00*

U.S. Cl. 252—70 **13 Claims**

10. The method of preparing a heat storage means comprising: mixing, by volume, between 60 and 70% sand having metallic properties, between 20 and 30% clay having metallic properties, between 5 and 8% cement, and between 2 and 5% ironite until a uniform mixture is obtained; adding water to the mixture to achieve between 4 and 8% moisture in the mix; and compacting said mix under approximately 225,000 psi to form a block-like structure of high heat storage capacity.

4,507,219

STABLE LIQUID DETERGENT COMPOSITIONS

Larry J. Hughes, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 522,915, Aug. 12, 1983, abandoned. This application May 31, 1984, Ser. No. 615,852

Int. Cl.³ C11D *1/08, 1/86, 9/46*

U.S. Cl. 252—118 **10 Claims**

1. A heavy-duty liquid detergent composition comprising, by weight:

(a) from about 5% to about 15%, on an acid basis, of a sulfonate surfactant containing a C_{10}–C_{16} alkyl or alkenyl group;

(b) from about 8% to about 18%, on an acid basis, of an alcohol ethoxylate sulfate surfactant of the formula $RO(C_2H_4O)_m$-SO_3M, wherein R is a C_{10}–C_{16} alkyl or hydroxyalkyl group, m is from about 0.5 to about 4, and M is a compatible cation;

(c) from about 2% to about 15% of an ethoxylated nonionic surfactant of the formula $R^1(OC_2H_4)_nOH$, wherein R^1 is a C_{10}–C_{16} alkyl group or a C_8–C_{12} alkyl phenyl group, n is from about 3 to about 9, and said nonionic surfactant has an HLB of from about 10 to about 13;

(d) from about 0% to about 5% of a cosurfactant selected from the group consisting of:

(i) quaternary ammonium surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]_2R^5N^+X^-$$

wherein R^2 is an alkyl or alkyl benzyl group having from about 6 to about 16 carbon atoms in the alkyl chain; each R^3 is selected from the group consisting of $—CH_2CH_2—$, $—CH_2CH(CH_3)—$, $—CH_2CH(CH_2OH)—$, $—CH_2CH_2C$-$H_2—$, and mixtures thereof; each R^4 is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl, benzyl, and hydrogen when y is not 0; R^5 is the same as R^4 or is an alkyl chain wherein the total number of carbon atoms of R^2 plus R^5 is from about 8 to about 16; each y is from 0 to about 10 and the sum of the y values is from 0 to about 15; and X is any compatible anion;

(ii) amine surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]R^5N$$

wherein R^2, R^3, R^4, R^5 and y are as defined above;

(iii) amine oxide surfactants having the formula:

$$[R^2(OR^3)_y][R^4(OR^3)_y]R^5N\rightarrow O$$

wherein R^2, R^3, R^4, R^5 and y are as defined above;

(e) from about 5% to about 20% of a C_{10}–C_{14} saturated fatty acid, the weight ratio of C_{10}–C_{12} fatty acid to C_{14} fatty acid being at least 1;

(f) from about 3% to about 8%, on an acid basis, of a water-soluble polycarboxylate builder material;

(g) from about 0 to about 0.04 moles per 100 grams of composition of an alkanolamine selected from the group consisting of monoethanolamine, diethanolamine and triethanolamine;

(h) potassium and sodium ions in a potassium to sodium molar ratio of from about 0.1 to about 1.3;

(i) from about 2% to about 10% ethanol;

(j) from about 2% to about 15% of a polyol containing from 2 to 6 carbon atoms and from 2 to 6 hydroxy groups; and
(k) from about 25% to about 40% water;
said composition containing from about 20% to about 35% of (a), (b), (c) and (d); from about 8% to about 28% of (e) and (f); from about 33% to about 50% of (a), (b), (c), (d), (e) and (f); from about 8% to about 20% of (i) and (j); and from about 35% to about 55% of (i), (j) and (k); the weight ratio of (a) to (b) being from about 0.3 to about 1.7; the weight ratio of (a) plus (b) to (c) being from about 1 to about 10; and all of said components being selected to provide an isotropic liquid at 55° F. (12.8° C.) having an initial pH of from about 7.5 to about 9.0 at a concentration of about 10% by weight in water at 68° F. (20° C.).

4,507,220

AQUEOUS SUSPENSIONS OF PEROXYDISULFATES AND THEIR USE AS OXIDATIVE DESIZING AGENTS FOR TEXTILE GOODS SIZED WITH STARCH

Werner Streit, Bobenheim; Linda Witt, Mannheim, and Heinz-Dieter Angstmann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 23, 1982, Ser. No. 452,491

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202760

Int. Cl.[3] **D06L** *1/14*

U.S. Cl. 252—186.1 **9 Claims**

1. A water-containing peroxydisulfate suspension containing
10–40% by weight of potassium peroxydisulfate,
2–45% by weight of a water-soluble polymer or copolymer of acrylic acid and/or maleic acid,
which may in addition contain 0–80% by weight of an anionic surfactant, selected from the group consisting of C_8–C_{20}-alkanol half-ester of phosphoric or sulfuric acid, and an oxyethylation product thereof containing from 1 to 7 ethylene oxide units, which may be mixed with a nonionic surfactant, and
5–55% by weight of water,
wherein the aqueous phase contains from 12 to 65% by weight of not less than one other dissolved compound which keeps the system at a pH of between about 5 and 10 and is a source of potassium ions.

4,507,221

ANTHRAQUINONE DYE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Shuji Imazeki; Akio Mukoo; Mikio Sato, all of Ibaraki; Masaharu Kaneko, Kanagawa; Tetsuo Ozawa, Tokyo, and Tomio Yoneyama, Kanagawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Hitachi, Ltd., both of Tokyo, Japan

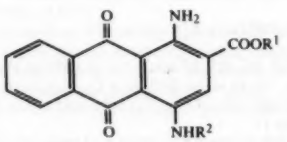
Filed Jul. 1, 1983, Ser. No. 510,111

Claims priority, application Japan, Jul. 1, 1982, 57-114506; Jul. 1, 1982, 57-114507

Int. Cl.[3] **C09K** *3/34;* **G02F** *1/13;* **C09B** *1/26*

U.S. Cl. 252—299.1 **4 Claims**

1. An anthraquinone dye represented by the formula (I)

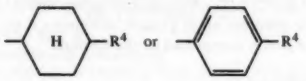


(I)

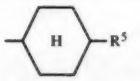
wherein R^1 is a trans-4-alkylcyclohexyl group, a trans-4-cyclohexylcyclohexyl group, a trans-4-alkylcyclohexylcyclohexyl group, a p-(trans-4-alkylcyclohexyl)phenyl group, or an aryl group which may be substituted with an alkyl group, or an alkoxy group; and R^2 is an alkyl group which may be substituted with an alkoxy group or a cycloalkyl, aralkyl or aryl group which may be substituted with an alkyl group, an alkoxy group or an alkoxyalkyl group, with the proviso that when R^1 is a substituted aryl group, at least one of R^1 and R^2 is as follows:

R^1 is

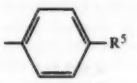
wherein R^3 is a C_{5-9} alkyl group or alkoxy group; and R^2 is a C_{5-18} alkyl group,



wherein R^4 is a C_{1-9} alkyl group, alkoxy group,

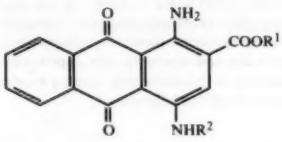


or



wherein R^5 is a C_{1-9} alkyl group.

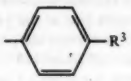
4. In a liquid crystal composition comprising at least one host liquid crystal and at least one pleochroic dye dissolved as a guest in said at least one host liquid crystal, wherein said at least one pleochroic dye includes at least one anthraquinone dye represented by the formula (I)



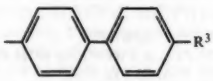
(I)

wherein R^1 is a trans-4-alkylcyclohexyl group, a trans-4-cyclohexylcyclohexyl group, a trans-4-alkylcyclohexylcyclohexyl group, a p-(trans-4-alkylcyclohexyl)phenyl group, an alkyl group which may be substituted with an alkoxy group or an alkylamino group, or an aralkyl or aryl group which may be substituted with an alkyl group, an aralkyl group, an aryl group, an alkoxy group, or an alkylamino group; and R^2 is an alkyl group which may be substituted with an alkoxy group, an alkylamino group, an cycloalkyl group, or an alkylcycloalkyl group; or a cycloalkyl, aralkyl, or aryl group which may be substituted with an alkyl group, an alkoxy group, an alkylamino group, an cycloalkyl group, an alkylcycloalkyl group, an aryl group, an aralkyl group, or an alkoxyalkyl group, with the proviso that when R^1 is a substituted alkyl group, aralkyl group, or aryl group, at least one of R^1 and R^2 is as follows:

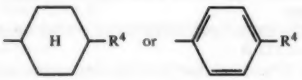
R^1 is a C_{5-18} alkyl group,



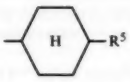
or



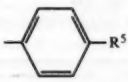
wherein R^3 is a C_{5-9} alkyl group or alkoxy group; R^2 is a C_{5-18} alkyl group,



wherein R^4 is a C_{1-9} alkyl group, alkoxy group,



or



wherein R^5 is a hydrogen atom, C_{1-9} alkyl group, or alkoxy group.

4,507,222

LIQUID-CRYSTALLINE COMPOUNDS

Hiromichi Inoue; Masahiro Fukui; Yasuyuki Goto, and Susumu Tokita, all of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

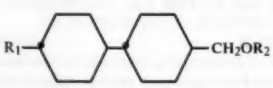
Filed Mar. 15, 1983, Ser. No. 475,529

Claims priority, application Japan, Mar. 26, 1982, 57-48395; Mar. 30, 1982, 57-51822

Int. Cl.³ C09K *3/34;* **G02F** *1/13;* **C07C** *69/75*

U.S. Cl. 252—299.63 **2 Claims**

1. A liquid-crystalline compound expressed by the general formula



(II)

wherein R_1 and R_2 each represent an alkyl group of 1 to 8 carbon atoms.

4,507,223

HIGH CONCENTRATION SURFACTANT SLURRY

Tetsuo Tano, Chiba, and Akira Hayashi, Yachiyo, both of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,369

Claims priority, application Japan, Aug. 10, 1982, 57-138958

Int. Cl.³ B01F *17/02;* **C09K** *3/00;* **C11D** *1/14;* **E21B** *43/20*

U.S. Cl. 252—353 **4 Claims**

1. A high concentration surfactant slurry comprising (i) 55% to 75% by weight of olefin sulfonates containing at least 50% by weight of internal olefin sulfonates, (ii) 5% to 40% by weight of at least one hydrocarbon selected from the group consisting of paraffins, olefins, and aromatic hydrocarbons having 6 to 24 carbon atoms, and (iii) 1% to 40% by weight of water.

4,507,224

CERAMICS CONTAINING FIBERS OF SILICON CARBIDE

Yasuo Tolbana, Osaka, and Kazuo Ueno, Ikeda, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,551

Claims priority, application Japan, Dec. 3, 1982, 57-213026; Dec. 3, 1982, 57-213027

Int. Cl.³ H01B *1/04*

U.S. Cl. 252—516 **11 Claims**

1. A silicon carbide-containing ceramic article of specific resistance not exceeding 10 Ω-cm, using as matrix phase thereof one member selected from the group consisting of alumina, zirconia, magnesia, ferrites, uranium oxide, thorium oxide, $MgAl_2O_4$, $NiFeO_4$, $NiCrO_4$, $MgFe_2O_4$, $LaCrO_3$, $LaSrCrO_3$ and $SrZrO_3$, and having dispersed in said matrix phase fibrous crystals of silicon carbide 10 to 500 μm in length and 0.1 to 10 μm in diameter in an amount falling in the range of 5 to 50% by weight based on the combined amount of the composite.

4,507,225

PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES WITH 1-PHENYLPENTEN-4-ONE-1 AND METHYL HOMOLOGUES THEREOF

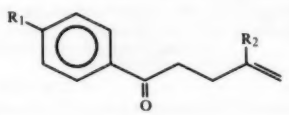
Mark A. Sprecker, Sea Bright, and Marie R. Hanna, Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,045

Int. Cl.³ A61K *7/46;* **C11D** *9/30*

U.S. Cl. 252—522 R **10 Claims**

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to a perfume composition base, a cologne base or a perfumed article base, an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_1 and R_2 each represent methyl or hydrogen with the proviso that R_1 and R_2 are not both methyl.

4,507,226
RADIOCHROMIC LIQUID SOLUTION

John E. Noakes, Athens, Ga., and Randolph A. Culp, Lyndhurst, Ohio, assignors to Bicron Corporation, Newbury, Ohio

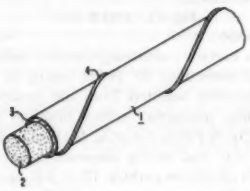
Continuation-in-part of Ser. No. 172,250, Jul. 25, 1980,. This application Mar. 2, 1982, Ser. No. 353,813
Int. Cl.[3] G01N 21/00
U.S. Cl. 252—600 11 Claims

1. A radiochromic liquid for the measurement of ionizing radiation of less than 1000 rads comprising 100 parts by weight of a substantially colorless polar solvent which is free of hydroxyl groups, at least 50 millimoles of a hydrophobic substituted amino triphenyl methane leucocyanide dye dissolved in such solvent, said dye being in its colorless state, and enough acid dissolved in such solvent to make the solution slightly acidic with a pH of 5 to 7, said acid being substantially colorless and substantially free of water.

4,507,227
COMMINUTING IRRADIATED FERRITIC STEEL

Roger E. Bauer; Jerry L. Straalsund, both of Kennewick, Wash., and Bryan A. Chin, Auburn, Ala., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 17, 1982, Ser. No. 419,371
Int. Cl.[3] G21F 9/28
U.S. Cl. 252—626 10 Claims

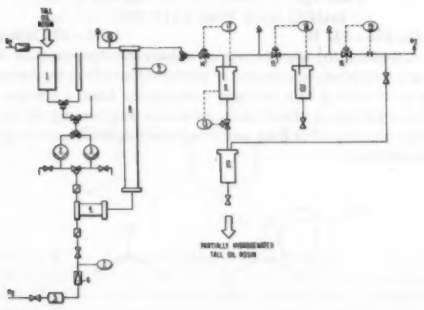


1. A method of comminuting irradiated ferritic steel comprising placing said steel into a solution of a compound selected from the group consisting of sulfamic acid, bisulfate compounds, and mixtures thereof.

4,507,228
PARTIAL HYDROGENATION OF TALL OIL ROSIN

Don P. Duncan, Mt. Pleasant, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Mar. 15, 1983, Ser. No. 475,482
Int. Cl.[3] C09F 1/00, 7/00
U.S. Cl. 260—97.6 7 Claims



1. A process for the partial hydrogenation and sulfur reduction of a sulfur-containing tall oil rosin material comprised of a mixture of resin acids so as to selectively hydrogenate the olefinic double bonds of the acids, comprising contacting the tall oil rosin with hydrogen gas in the presence of a catalytically effective amount of a carbon supported palladium metal catalyst at a temperature of from 185° C. to 320° C. and a pressure of at least 800 psig for from 0.5 to 4.0 hours to provide a partially hydrogenated tall oil rosin of reduced sulfur content, based on the starting rosin material, and having an acid number no lower than 160.

4,507,229
TISSUE PROTEIN PP_4, A PROCESS FOR ISOLATING IT AND ITS USE

Hans Bohn, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,346
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3315000
Int. Cl.[3] C07G 7/00; A61K 35/42, 35/50, 39/395
U.S. Cl. 260—112 B 4 Claims

1. Protein PP_4, which has the following characteristics
(a) an electrophoretic mobility in the range between that of α_1 and α_2 globulins;
(b) an isoelectric point of 4.85±0.15;
(c) a sedimentation coefficient $s_{20,w}{}^{O}$ of 3.3±0.2S;
(d) a molecular weight determined in polyacrylamide gel containing sodium dodecylsulfate (DSD) of 35,000±5,000;
(e) an extinction coefficient $E_{1\ cm}{}^{1\%}$ (280 nm) of 5.9±0.6;
(f) a carbohydrate content of 2.4±0.94% (g/100 g) (mannose 0.3±0.2%, galactose 0.4±0.2%, xylose 0.1±0.04%, glucose 0.2±0.1%, glucosamine 1.0±0.2% and neuraminic acid 0.4±0.2%) and
(g) the following aminoacid composition:

Aminoacid	Residues per 100 residues (mol-%)	Coefficient of variation
lysine	6.95	1.14
histidine	0.97	17.4
arginine	5.44	1.77
aspartic acid	11.41	1.68
threonine	6.78	2.40
serine	6.21	2.26
glutamic acid	12.25	0.43
proline	1.96	6.20
glycine	6.68	3.83
alanine	7.92	1.67
cystine ½	0.77	19.5
valine	5.34	3.80
methionine	1.98	6.00
isoleucine	5.21	2.23
leucine	11.50	0.45
tyrosine	3.55	4.21
phenylalanine	4.07	3.77
tryptophan	0.93	23.9

4,507,230
PEPTIDE SYNTHESIS REAGENTS AND METHOD OF USE

James P. Tam; William F. Heath, Jr., both of New York, N.Y., and Robert B. Merrifield, Cresskill, N.J., assignors to Research Corporation, New York, N.Y.

Filed May 12, 1982, Ser. No. 377,443
Int. Cl.[3] C07C 103/52; C08L 89/00
U.S. Cl. 260—112.5 R 19 Claims

1. In a method of synthesizing peptides by the solid phase methodology, wherein the growing peptide chain is covalently attached by a functional group through a linkage having proton affinity, to the organic residue of a resin, the improvement wherein said peptide is detached from said resin using a mix-

ture of HF and a base selected from the group consisting of di-C_1–C_{10}-alkyl sulfides and alkyl phenyl sulfides, wherein the amounts of HF and base in said mixture are adjusted so that said detachment occurs predominantly by an S_N2 mechanism, said HF being present in said mixture in an amount between 0.1 and 60% by volume.

4,507,231

PROCESS FOR THE PREPARATION OF α-ASPARTYL PHENYLALANINE METHYL ESTER

Maurice J. Gourbault, Paris, France, assignor to Laboratoires Fournier S.A., Dijon, France

PCT No. PCT/FR82/00181, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO83/01619, PCT Pub. Date May 11, 1983

PCT Filed Nov. 5, 1982, Ser. No. 522,165

Claims priority, application France, Nov. 5, 1982, 82 00181

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. A process for producing N-formyl α-aspartam, comprising the steps of:

(1) preparing a mixture comprised of α-isomer and β-isomer of N-formyl aspartam;

(2) heating said mixture in the presence of acetic anhydride to a temperature between about 10° and about 70° C., such that said N-formyl aspartam is converted to the corresponding aspartimide; and thereafter

(3) hydrolyzing said aspartimide in an acid solution at a pH in the range between about 2.3 and about 3.5, such that said β-isomer is converted to α-isomer.

4,507,232

PEPTIDE DERIVATIVES

Masaharu Tamai, Hasuda; Takashi Adachi, Kuki; Kiyoshi Oguma, Gyoda; Kazunori Hanada; Sadafumi Omura, both of Ageo, and Nobuhiko Katunuma, Tokushima, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

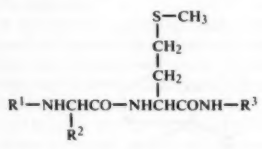
Filed Dec. 16, 1983, Ser. No. 562,439

Claims priority, application Japan, Dec. 21, 1982, 57-224684

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **6 Claims**

1. Peptide compounds having the formula



wherein R^1 is selected from the group consisting of a succinyl group, a leucyl group, and a β-alanyl group, R^2 is a p-hydroxybenzyl group, and R^3 is a naphthyl group, and pharmacologically acceptable acid addition salts thereof.

4,507,233

COLORED MOLECULAR WEIGHT MARKER

Hiraku Saito; Yasuo Suzuki; Katsumi Fujii; Kaoru Miyazaki, and Takekazu Horio, all of Osaka, Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 256,398, Apr. 22, 1981, abandoned. This application Apr. 18, 1983, Ser. No. 485,375

Int. Cl.³ B01D *57/02;* **C07G** *7/04*

U.S. Cl. 260—115 **12 Claims**

1. A colored molecular weight marker for molecular sieve chromatography, which comprises at least one member selected from the group consisting of:

(1) a monomer of the equine heart muscle cytochrome C having a molecular weight of 12,300 or an oligomer or polymer consisting of at least two molecules of said equine heart muscle cytochrome C,

(2) a monomer of a colored protein having a molecular weight of 1,800 which is obtained by treating the equine heart muscle cytochrome C with trypsin, or a colored protein having a molecular weight of 2,400 which is obtained by treating the equine heart muscle cytochrome C with chymotrypsin, or an oligomer or polymer consisting of at least two molecules of said colored protein having a molecular weight of 1,800 or of said colored protein having a molecular weight of 2,400,

(3) a composite obtained by coupling said monomer, oligomer or polymer (1) with said monomer, oligomer or polymer (2),

(4) a composite obtained by coupling said monomer, oligomer or polymer (1) and/or said monomer, oligomer or polymer (2) with bovine serum albumin having a molecular weight of 68,000,

(5) an oligomer or polymer consisting of at least two molecules of said composite (3), and

(6) an oligomer or polymer consisting of at least two molecules of said composite (4),

with the proviso that said marker is not a monomer of equine heart muscle cytochrome C having a molecular weight of 12,300, alone,

wherein the residual Schiff bases present in each said oligomer, polymer and composite have been converted into secondary amines, and wherein the amino residues of each said marker component are acetylated or succinylated to an extent sufficient to avoid being adsorbed on the carrier for the molecular sieve chromatography.

4,507,234

CONJUGATE HAVING CYTOTOXICITY AND PROCESS FOR THE PREPARATION THEREOF

Yoshinori Kato; Naoji Umemoto, both of Hino; Masahiko Saito, Saitama, and Takeshi Hara, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 21, 1983, Ser. No. 563,860

Claims priority, application Japan, Dec. 24, 1982, 57-226236

Int. Cl.³ C07G *7/00;* **C07C** *103/52;* **C08L** *89/00;* **A61K** *39/44*

U.S. Cl. 260—121 **10 Claims**

1. A conjugate having cytotoxicity prepared by covalently binding a serum albumin having a cytotoxic substance linked thereto to an immunoglobulin, or its fragment, which is able to selectively bind to a particular antigen of a cell to be killed,

wherein said immunoglobulin or its fragment is bound to said serum albumin by means of at least one sulfur atom, and wherein said serum albumin is linked to said cytoxic substance by an imino group.

4,507,235

METHOD FOR PREPARING PEPTIDES AND INTERMEDIATE PRODUCTS

Erich Wünsch, Tutzing, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Division of Ser. No. 331,311, Dec. 16, 1981, abandoned, which is a division of Ser. No. 145,500, Apr. 29, 1980, Pat. No. 4,368,192. This application Mar. 5, 1984, Ser. No. 586,187

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917603; Oct. 25, 1979, 2943132

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **5 Claims**

1. In the method of preparing peptides containing a tyrosine-O-sulfate moiety the improvement comprising the use of tyrosine-O-sulfate barium salt or a N-acyl derivative thereof in said synthesis.

4,507,236

FIBRE-REACTIVE DYES, CONTAINING BOTH CHLORO AND FLUORO TRIAZINE RADICALS

Herbert Seiler, Riehen, and Gert Hegar, Schönenbuch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

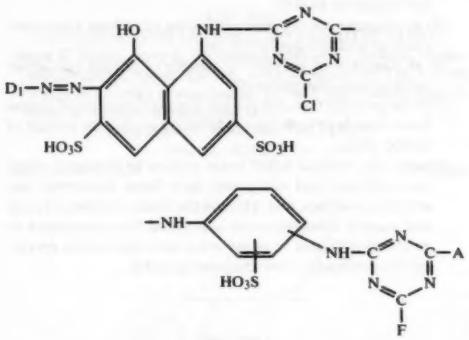
Continuation of Ser. No. 283,414, Jul. 15, 1981, abandoned, which is a continuation of Ser. No. 141,453, Apr. 18, 1980, abandoned, which is a continuation of Ser. No. 037,591, May 9, 1979, abandoned, which is a continuation of Ser. No. 742,810, Nov. 18, 1976, abandoned. This application Dec. 27, 1982, Ser. No. 452,974

Claims priority, application Switzerland, Nov. 25, 1975, 15256; Oct. 25, 1976, 13450

Int. Cl.[3] **C09B** *62/08, 62/085, 62/09, 62/095*

U.S. Cl. 534—634 **2 Claims**

1. Fibre-reactive dye of the formula



wherein D_1 is the radical of a diazo component of the benzene or naphthalene series and A is an amino group.

4,507,237

2-[(2-METHOXY-5-HALO)AZO]-1-H-IMIDAZOLES AND METHOD OF PRODUCTION OF 2-[(2-METHOXY)AZO]-1-H-IMIDAZOLES

Isao Niimura, Iwatsuki; Shigeo Maeda, and Hideo Okazaki, both of Tokyo, all of Japan, assignors to Hodogaya Chemical Co., Ltd. and Mochida Seiyaku Kabushiki Kaisha, both of Tokyo, Japan

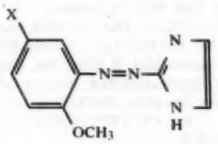
Filed Jul. 29, 1980, Ser. No. 173,359

Claims priority, application Japan, Jul. 30, 1979, 54-97058

Int. Cl.[3] **C07C** *107/04;* **C09B** *29/01, 29/36;* **A61K** *31/655*

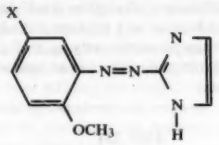
U.S. Cl. 260—157 **7 Claims**

1. A compound represented by the formula:



wherein X is halogen or an acid addition salt thereof.

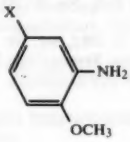
6. A process for the high yield preparation of a compound of the formula



(I)

wherein X is a hydrogen or halogen atom, or an acid addition salt thereof, comprising

reacting a compound of the formula



(II)

wherein X is as previously defined with a nitrite and hydrochloric acid to form a diazonium compound, and

reacting the resulting diazonium compound of the above reaction with imidazole in a quantity of about 5 to 10 moles of imidazole per mole of diazonium compound to give the compound of formula (I) in a high yield.

4,507,238

PROCESS FOR THE PREPARATION OF 3-(Δ^4-3-KETOSTEROID-17α-YL)PROPIONIC ACID LACTONES

Klaus Junghans, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

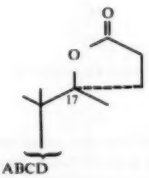
Filed Feb. 22, 1984, Ser. No. 582,644

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1983, 3306554

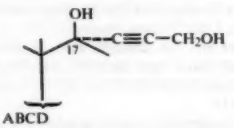
Int. Cl.[3] **C07J** *21/00*

U.S. Cl. 260—239.57 **12 Claims**

1. A process for preparing a 3-(Δ^4-3-ketosteroid-17α-yl)propionic acid lactone of the androstane series of the partial formula:



wherein ABCD represents an optionally substituted cyclopentanophenanthrene steroid, comprising hydrogenating the corresponding 17α-(3-hydroxypropynyl)-17β-hydroxy steroid of the partial formula:



with an effective amount of Raney nickel to form the corresponding 17α-(3-hydroxypropenyl)-17β-hydroxy steroid, treated the latter with 2–20 times the amount of Raney nickel

used in the preceding hydrogenation, and thereafter oxidizing the resultant product with chromic acid.

4,507,239

PENICILLIN DERIVATIVES AND PROCESS FOR PREPARATION

Ronald J. Micetich, Sherwood Park, Canada; Shigeru Yamabe, Kobe, Japan; Shuichi Ueda, Tokushima, Japan; Naobumi Ishida, Hiroshima, Japan, and Takeshi Ishizawa, Naruto, Japan, assignors to Taiho Pharmaceutical Company, Limited, Japan

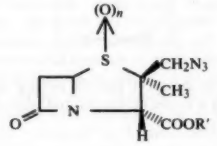
Filed Jun. 22, 1983, Ser. No. 487,558

Claims priority, application Japan, Apr. 23, 1982, 57-69142

Int. Cl.³ C07D *499/00;* **A61K** *31/425*

U.S. Cl. 260—245.2 R **8 Claims**

1. A penicillin derivative represented by the following formula:



wherein n is 0, 1 or 2, and R' is hydrogen; or a pharmaceutically acceptable salt thereof.

4,507,240

PROCESS FOR PURIFYING CRUDE MONOCHLORO- AND MONOBROMOANTHRAQUINONE

Tibor Somlo, and Johann Regli, both of Birsfelden, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 23, 1983, Ser. No. 554,651

Claims priority, application Switzerland, Nov. 29, 1982, 6922/82

Int. Cl.³ C07C *50/24*

U.S. Cl. 260—384 **7 Claims**

1. A process for purifying crude monochloro- or monobromoanthraquinone, which comprises mixing monochloro- or monobromoanthraquinone which contains by-products as impurities with a non-polar aliphatic solvent in such a ratio that at elevated temperature more than half of the crude product goes into solution and the remainder which contains the impurities forms a eutectic melt as second lower phase, separating said melt, allowing the saturated solution to cool, and isolating the pure precipitated monochloro- or monobromoanthraquinone.

4,507,241

METHOD FOR THE HYDROCARBYLATION OF NAPHTHOQUINONE DERIVATIVES

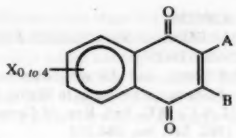
George W. Parshall, and Wilson Tam, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 7, 1983, Ser. No. 472,753

Int. Cl.³ C07C *50/12*

U.S. Cl. 260—396 R **15 Claims**

1. A noncatalytic method for making a 1,4-naphthoquinone derivative comprising reacting a naphthoquinone having the formula



where:

A and B are the same or different and are selected from the group consisting essentially of Cl, Br, I, —OR,

and

X is hydrocarbyl of up to about 20 carbons including straight, branched or cyclic alkyl, aryl, fused-ring aryl, aralkyl, or alkaryl;

R is C_1 to C_5 alkyl;

R^1 is C_1 to C_5 alkyl, C_1 to C_5 perfluoroalkyl, or aryl;

R^2 is aryl; with an organometallic compound comprising (i) a metal selected from Al and Zn, and (ii) a hydrocarbyl moiety of up to 20 carbon atoms.

4,507,242

MANUFACTURE OF ANDROSTANDIONE

George Krsek, Culver, Ind., assignor to Progenics, Inc., New York, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,539

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.3 **11 Claims**

1. A method for the stereospecific preparation of 5-β-androstandione which comprises catalytically hydrogenating androstendione with a palladium catalyst and thereafter recovering the 5-β-androstandione thus produced.

4,507,243

MANUFACTURE OF ARYL ESTERS

Anil B. Goel, Worthington, and Peter E. Throckmorton, Plain City, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 22, 1983, Ser. No. 468,311

Int. Cl.³ C09F *5/08;* **C07C** *67/00*

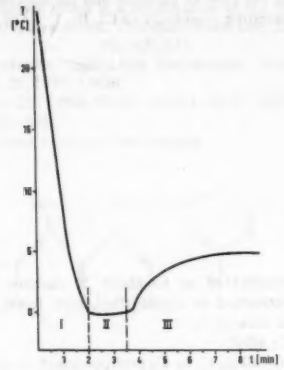
U.S. Cl. 260—410.5 **12 Claims**

1. An oxidation process for the manufacture of aryl esters comprising contacting the reaction mixture of an aromatic hydrocarbon, a carboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of from 100° to 300° C. with a catalyst composed of A palladium carboxylate, a chromium carboxylate and a carboxylate of at least one member selected from the group consisting of zinc, manganese, tin, cobalt and nickel wherein the molar ratio of Pd:Cr:Zn, Mn, Sn, Co or Ni is in the range of from 1.0:0.1:0.1 to 1:20:20.

4,507,244
METHOD FOR CRYSTALLIZING A SUBSTANCE FROM A SOLUTION

Gerhard von Rappard, Bad Iburg, and Jürgen Grundmann, Hilter, both of Fed. Rep. of Germany, assignors to Walter Rau Lebensmittelwerke GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,254
Int. Cl.³ B01D 9/02
U.S. Cl. 260—428.5 **6 Claims**



1. A method for crystallizing a substance from a solution by cooling, including the steps of:

(a) rapidly cooling the solution at a rate of at least 500° C. per hour by evaporation cooling at reduced pressure to a temperature below the crystallization temperature, the solution being a mother liquor containing solvents and the substance including fats,

(b) transferring the supercooled, and hence supersaturated but not yet crystallizing, solution to a retention tank within approximately the first 60 to 90 seconds from the time the solution reaches the below crystallization temperature, and

(c) subsequently adiabatically crystallizing the solution in the retention tank.

4,507,245
PROCESS FOR THE PRODUCTION OF A RARE EARTH METAL ALKOXIDE

Yoshiharu Ozaki, Musashino; Kimiyoshi Kaneko, Isehara, and Senshu Mitachi, Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 509,017
Claims priority, application Japan, Jun. 6, 1982, 57-1162468; Apr. 7, 1983, 58-59978
Int. Cl.³ C07C 29/68, 31/28
U.S. Cl. 260—429.2 **10 Claims**

1. A process for the production of a rare earth metal alkoxide of the general formula

$$M(OR)_3 \quad \text{(I)}$$

wherein M denotes a rare earth metal atom and R denotes an alkyl group, which comprises reacting a rare earth metal carboxylate represented by the general formula

$$M_nX_3 \quad \text{(II)}$$

wherein M is as defined above, X denotes the residue of a carboxylic acid and n is an integer of 1 or 2, provided that n is 1 when X denotes the residue of a mono-carboxylic acid; and n is 2 when X denotes the residue of a di-carboxylic acid, with an alkali metal alkoxide represented by the general formula

$$ROM' \quad \text{(III)}$$

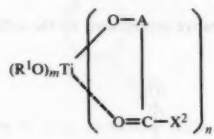
wherein R is an alkyl group as defined above and M' denotes an alkali metal, in an inert organic solvent or liquid under the anhydrous conditions.

4,507,246
TITANIUM CHELATE CATALYST

Daniel J. Brunelle, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 502,435, Jun. 9, 1983, Pat. No. 4,452,970. This application Jan. 20, 1984, Ser. No. 572,481
Int. Cl.³ C07F 7/28
U.S. Cl. 260—429.5 **5 Claims**

1. A titanium chelate compound having the formula



wherein each R^1 is an alkyl radical having up to about 20 carbon atoms; A is a hydroxy-substituted phenylene radical in which the —O— and

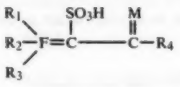
moieties occupy ortho positions; X^2 is lower alkyl or lower aryl; n is 1 or 2; and m is 4−n.

4,507,247
SULFONATED GROUP VA YLIDES AND PROCESS FOR PREPARING SAME

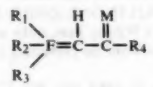
David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 209,674, Nov. 24, 1980, which is a continuation-in-part of Ser. No. 179,079, Aug. 18, 1980, which is a continuation-in-part of Ser. No. 179,078, Aug. 18, 1980, which is a continuation-in-part of Ser. No. 179,076, Aug. 18, 1980, which is a continuation-in-part of Ser. No. 179,005, Aug. 18, 1980. This application Feb. 25, 1983, Ser. No. 469,897
Int. Cl.³ C07F 9/90, 9/50, 9/72, 9/74
U.S. Cl. 260—446 **5 Claims**

1. A process for preparing a sulfonated ylide defined by the following formula:



which comprises dissolving the ylide defined by the following formula:



in a solvent and then adding SO_3 to the resulting solution, wherein R_1, R_2, R_3 and R_4 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radi-

cals having from about two to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy, or aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy; M is oxygen; and F is arsenic or antimony.

4,507,248

PREPARATION FROM HYDROXYLAMMONIUM SULFATE OF OXIMES AND HYDROXAMIC ACIDS VIA ALCOHOLIC HYDROXYLAMINE SOLUTION

Chempolil T. Mathew, Randolph, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 437,920, Nov. 1, 1982,. This application Sep. 23, 1983, Ser. No. 534,291

Int. Cl.[3] **C07C** *83/10, 131/00*

U.S. Cl. 260—500.5 H **20 Claims**

1. A process comprising the steps of:

(a) reacting an alcoholic solution of a base selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, ammonium hydroxide and the corresponding alkoxides of 1–5 carbons with solid hydroxylammonium sulfate, employing an alcohol of 1–3 carbons, a substantial absence of added water, a temperature not greater than about 30° C., a pressure and a time; said alcohol, temperature, pressure and time being sufficient to produce a liquid phase having at least 50% of the hydroxylamine values of the hydroxylammonium sulfate,

(b) reacting the hydroxylamine values in the liquid phase with an organic reagent selected from the group consisting of aldehydes, ketones, acid chlorides and esters to form the corresponding product selected from the group consisting of aldoximes, ketoximes, and hydroxamic acids,

(c) separating the solid phase comprising a sulfate salt corresponding to said base from the liquid phase containing hydroxylamine values or containing said corresponding product, and

(d) recovering from the liquid phase said product substantially free of water and sulfate impurities.

4,507,249

PROCESS FOR MAKING DERIVATIVES OF VINYLPHOSPHONIC ACID OR VINYLPYROPHOSPHONIC ACID

Werner Pieper, Erftstadt, and Werner Krause, Hürth-Knapsack, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 4, 1983, Ser. No. 472,261

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1982, 3210419

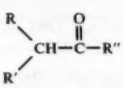
The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[3] **C07F** *9/38*

U.S. Cl. 260—502.4 R **14 Claims**

1. A process for making phosphonic or pyrophosphonic acids from ketones comprising:

reacting a ketone of the formula



in which either

(a) R stands exclusively for a halogen, R′ either stands for a halogen or hydrogen, a halogen-substituted or unsubstituted alkyl, aryl, alkaryl or aralkyl group having from 1 to 18 carbon atoms, and R″ stands for an alkyl, aryl, alkaryl, aralkyl or alkenyl group having from 1 to 18 carbon atoms, or

(b) R″ stands exclusively for an alkenyl group having from 2 to 18 carbon atoms and R and R′ being identical or different each stand for hydrogen or a halogen or a halogen-substituted or unsubstituted alkyl, aryl, alkaryl or aralkyl group having from 1 to 18 carbon atoms,

with tetraphosphorous hexoxide (P_4O_6) in the presence of at least 0.0001 weight %, based on the tetraphosphorus hexoxide of a proton donor or an amine at elevated temperatures, and

obtaining a phosphonic or pyrophosphonic acid reaction product having a substituted vinyl group, the said substituted vinyl group being substituted by R″ on one of the carbons of the vinyl group, and, if R and R′ are not hydrogen, by R and R′, on the other carbon of the vinyl group.

4,507,250

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE ACID

Izhak Bakel, Ramat Gan, Israel, assignor to Geshuri Laboratories Ltd., Tel Mond, Israel

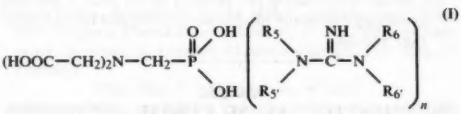
Continuation-in-part of Ser. No. 521,072, Aug. 8, 1983, abandoned. This application May 11, 1984, Ser. No. 609,213

Claims priority, application Israel, May 17, 1983, 68716

Int. Cl.[3] **C07F** *9/38*

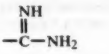
U.S. Cl. 260—502.5 F **12 Claims**

1. A process for producing N-phosphonomethylglycine acid (NPMG) comprising (a) oxidizing an N-(phosphonomethyl) iminodiacetic acid (NPMIDA) derivative of the general formula I



(I)

wherein n is 1 or 2 and R_5, $R_{5'}$, R_6 and $R_{6'}$ are independently H, NH_2,



or an aryl, cycloalkyl or straight or branched chain alkyl or alkenyl group optionally substituted by hydroxy or halogen, or an alkylaryl group, provided that at least one of R_5, $R_{5'}$, R_6 or $R_{6'}$ is hydrogen, to produce a corresponding iminourea salt of NPMG and then (b) reacting said salt with an acid stronger than NPMG whereby NPMG is produced and there remains in solution the iminourea salt of said stronger acid.

4,507,251

β-OXIMINOALKYLPHOSPHONIC ACID ESTERS

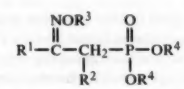
David S. Soriano, Cheektowaga; Timothy R. Demmin, Grand Island, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 339,269, Jan. 15, 1982, abandoned. This application Jul. 26, 1982, Ser. No. 401,792

Int. Cl.[3] **C07F** *9/40;* **A01N** *57/12*

U.S. Cl. 260—944 **9 Claims**

1. β-Oximinoalkylphosphonic acid ester derivatives of the general formula:



and salts thereof, wherein:

R^1 is a substitutent selected from the group consisting of H, C_1 to C_{20} alkyl, cycloalkyl, and aryl substituents;
R^2 is a substituent selected from the group consisting of H, C_1 to C_{20} linear alkyl and aryl substituents;
R^3 is a substituent selected from the group consisting of a cycloalkyl, 1-alkoxyalkyl, aryl, acyl, N-substituted carbamoyl and phosphorus containing heterocycle substituents; and
R^4 is a substituent selected from the group consisting of H and C_1 to C_{20} alkyl.

4,507,252

PROCESS FOR THE FORMATION OF DIALKYL PHOSPHOROCHLORIDOTHIONATES

Brian J. Lobo, Columbia, Tenn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1982, Ser. No. 454,824
Int. Cl.³ C07F *9/20*
U.S. Cl. 260—986 **13 Claims**

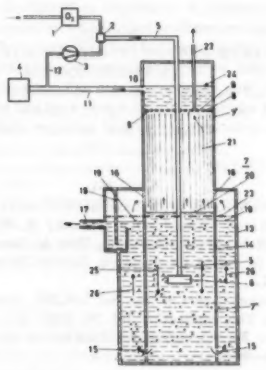
1. A process for the formation of dialkyl phosphorochloridothionates by chlorinating an alkyl ester of dithiophosphoric acid which comprises:
(a) reacting a charge of an alkyl ester of dithiophosphoric acid with chlorine to form a reaction product containing disulfur dichloride;
(b) reacting an additional amount of the alkyl ester of dithiophosphoric acid with the disulphur dichloride contained in the reaction product of (a); and
(c) further chlorinating the product of (b) with a reactant consisting essentially of chlorine to complete the chlorination process.

4,507,253

EQUIPMENT FOR GASSING A LIQUID AND PROCESS FOR OPERATING THE EQUIPMENT

Rudolf Wiesmann, Gossau, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 31, 1983, Ser. No. 462,364
Claims priority, application Switzerland, Feb. 9, 1982, 780/82
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—22 **9 Claims**



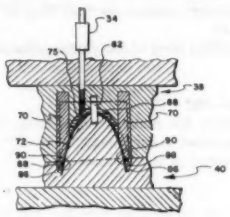
1. Equipment for gassing a liquid with ozone, said equipment comprising:
(a) an upwardly open bubble chamber which, during use of the equipment, contains liquid up to a first level which is lower than the top of said upwardly open bubble chamber;
(b) a downwardly open trickle chamber located immediately above and in fluid communication with said upwardly open bubble chamber such that, during use of the equipment, liquid falling through said trickle chamber falls directly into said bubble chamber;
(c) first means for causing a major portion of the liquid to fall through said trickle chamber in a plurality of spaced paths;
(d) an enclosed chamber which, during use of the equipment, contains liquid up to a second level which is lower than the top of said enclosed chamber, said enclosed chamber having a discharge opening and a baffle which prevents the escape of the ozone through said discharge opening;
(e) an ozone distributor located in said upwardly open bubble chambers;
(f) second means for feeding a mixture of a minor portion of the liquid and all of the ozone to said ozone distributor;
(g) a first path of fluid communication leading from the bottom of said upwardly open bubble chamber to said enclosed chamber at a point beneath said discharge opening;
(h) a second path of fluid communication leading from said enclosed chamber above said second level to the bottom of said downwardly open trickle chamber; and
(i) a third path of fluid communication leading from the top of said trickle chamber,
whereby, during use of the equipment, ozone flows from said ozone distributor and, depending on the speed that the liquid flows downwardly through said bubble chamber, either:
(i) bubbles to the top of the liquid in said bubble chamber and then passes in counter-current fashion through the falling liquid in said trickle chamber and into said third path of fluid communication or
(ii) passes into said enclosed chamber through said first path of fluid communication, bubbles to the top of the liquid in said enclosed chamber, passes into said trickle chamber through said second path of fluid communication, and then passes in counter-current fashion through the falling liquid in said trickle chamber and into said third path of fluid communication.

4,507,254

LIGHT REFLECTOR APPARATUS AND METHOD OF MAKING

Steven D. Daniels, Churchville; Jeffrey R. Stoneham, Hilton, and John K. Erickson, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,478
Int. Cl.³ B29D *11/00*
U.S. Cl. 264—1.9 **6 Claims**



1. A method of making light reflector apparatus including a housing within which is located a reflector having a shape for reflecting light emanating from a source of illumination into a beam of illumination, said method comprising:
(a) placing a front, light-reflecting surface of a flexible material in spaced relation to a forming surface, the contour of the forming surface being adapted to form the light-reflecting surface into a shape for reflecting light into a beam of illumination;
(b) enclosing the material in a fluid-receiving molding chamber a portion of which is defined by the forming surface

wherein at least portions of the flexible material remain spaced from the forming surface;

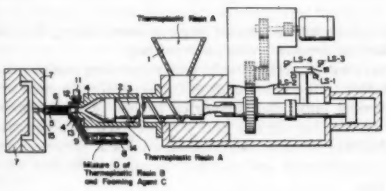
(c) injecting liquid plastic into the chamber under pressure against a rear surface of the flexible material for applying compressive forces to the material to move the spaced portions of the light-reflecting surface into intimate contact with the forming surface, thereby shaping the material according to the contour of the forming surface in response to the plastic; and

(d) solidifying the plastic to form a solid plastic housing underlying the rear surface of the flexible material for maintaining the shape of such material caused by the forming surface.

4,507,255
PROCESS AND APPARATUS FOR INJECTION-MOLDING FOAMED ARTICLE

Masao Shizawa, Hiratsuka, Japan, assignor to Orion Kasei Kabushiki Kaisha, Hiratsuka, Japan

Filed Mar. 30, 1983, Ser. No. 480,607
Int. Cl.³ B29D *27/00*; B29F *1/03*
U.S. Cl. 264—45.1 **16 Claims**



1. An injection-molding process for the preparation of a molded article of synthetic resins, said molded article including a core made of a foamed material and an outer skin layer made of an unfoaming synthetic resin, comprising:

(a) the step of continuously supplying and injecting a first molten flow of said unfoaming synthetic resin into a mold to form said outer skin layer;

(b) the step of subsequently feeding a second molten flow of a synthetic resin miscible with said unfoaming synthetic resin and containing a foaming agent into said first molten flow of said unfoaming synthetic resin without stopping supplying said first molten flow;

(c) the step of mixing and kneading said unfoaming synthetic resin with said synthetic resin containing said foaming agent to form a kneaded mass; and

(d) the step of injecting said kneaded mass into said mold to form said core.

4,507,256
PROCESS FOR FOAMING CELLULOSE ACETATE ROD

Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 26, 1983, Ser. No. 498,444
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—54 **7 Claims**

1. A process for producing a foamed, open cell filter rod which comprises extruding a molten composition at a temperature of about 220°–260° C. through an orifice of a screw extruder, said composition comprising

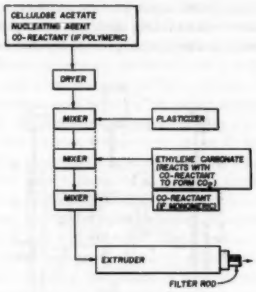
(a) cellulose acetate having an acetyl content of about 36–44% and a ball drop viscosity of about 10–38 sec.,

(b) about 3–10%, based on the weight of the composition, of a non-volatile plasticizer for said cellulose acetate,

(c) about 0.1–5%, based on the weight of the composition, of a nucleating agent,

(d) about 2–10%, based on the weight of the composition, of cyclic ethylene carbonate, and

(e) about 3–25%, based on the weight of the composition, of



a substance which will react with said ethylene carbonate under extrusion conditions to produce carbon dioxide, said substance having a melting or flow point of less than about 250° C.

4,507,257
PROCESS FOR PREPARING ACRYLIC FILAMENTS AND FIBERS

Walter Fester, Königstein; Bernd Huber, Kelheim, and Lieselotte Wappes, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,859
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209796
Int. Cl.³ D01F *6/18, 6/00*
U.S. Cl. 264—78 **8 Claims**

1. A process for preparing dry- or wet-spun filaments or fibers of improved dyeability from polymers comprising more than 50% by weight acrylonitrile units, comprising the steps of:

obtaining, from spinning, a filament bundle or tow,

continually treating the filament bundle or tow with an aqueous solution containing copper (I) ions during the fiber production process but before the first drying stage a first heat treatment above 100° C. so that a gel structure is preserved prior to the copper(I) treatment;

fixing the copper content in the thus-treated bundle or tow concurrently or by means of a subsequent heating to a temperature above about 60° C., provided that the concurrent or any subsequent heating is limited to temperatures at which whiteness of the filaments or fibers is substantially retained and the copper (I) ions remain in a dyeability-improving state.

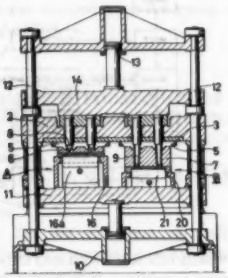
4,507,258
METHOD FOR INJECTION MOLDING A COMPOSITE PARISON

Katashi Aoki, 6037 Ohazaminamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Filed Aug. 26, 1983, Ser. No. 526,789
Claims priority, application Japan, Aug. 31, 1982, 57-151174
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—255 **4 Claims**

1. A method for injection molding a composite parison, comprising a first step wherein female neck molds mounted on a transport plate and male molds each cooperating with a female mold for forming a parison neck or an outer layer of the neck of a composite parison are brought together at a first molding station and molten resin is injected into a cavity formed by the cooperating male and female molds to mold the

outer neck portion of the composite parison, and a second step wherein said outer layer of the neck is transported by the female neck molds to a second molding station, whereby the female neck molds and the female and male parison forming molds for forming the main parison portion are brought together at said second molding station to clamp the female neck forming portion holding the previously formed outer neck



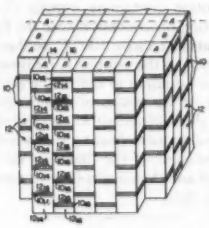
portion to form a continuous cavity including the interior surface of the outer neck portion, and molten resin different from the first mentioned molten resin is thereafter injected into said continuous cavity from a stationary source of resin to mold the main parison including an inner neck portion which is integral with said main parison portion and joined with the inner surface of the outer neck portion to form a composite parison.

4,507,259

AXIALLY STAGGERED SEED-BLANKET REACTOR FUEL MODULE CONSTRUCTION

Gary K. Cowell, Monroeville, and Carl P. DiGuiseppe, West Mifflin, both of Pa., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 28, 1982, Ser. No. 437,400
Int. Cl.³ G21C *1/00*
U.S. Cl. 376—173 **5 Claims**



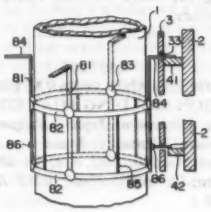
1. In a nuclear reactor employing a heterogeneous reactor core of blanket and seed nuclear fuel materials, the improvement comprising the provision of fuel rod modules of at least first and second types, each of said modules comprising alternating seed and blanket nuclear fuel regions along the length thereof, modules of the first and second type being positioned adjacent to one another and the axial locations of said seed and blanket regions of said fuel rod modules of said first type being offset relative the axial locations of said seed and blanket regions of said fuel rod modules of said second type so that the blanket regions of said first and second type modules lie adjacent to said seed regions of said second and first type modules, respectively and said blanket regions of said first and second modules are of different axial lengths respectively and are of substantially shorter axial lengths than said seed regions.

4,507,260

RAIL APPARATUS AROUND REACTOR PRESSURE VESSEL

Hirotsugu Fujimoto; Tatsukuma Hosono; Hiroshi Kimura; Sadao Shibuya, and Akisuke Naruse, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Apr. 7, 1982, Ser. No. 366,213
Claims priority, application Japan, Apr. 8, 1981, 56-53688
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—249 **20 Claims**



1. A rail apparatus for carrying equipment along the surface of a nuclear pressure vessel, comprising:

a plurality of vertical rails and supporting members connected to the upper ends of the vertical rails, each of said vertical rails being supported by one of said supporting members having one end portion fixed to a gamma-ray shielding member surrounding a nuclear pressure vessel,

a circumferential rail disposed to align with said vertical rails,

a plurality of turn tables by which said circumferential rail is connected to said vertical rails at a plurality of junctions substantially spaced apart from said upper ends of the vertical rails to form an integrated rail construction,

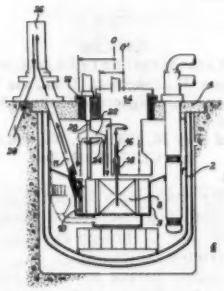
and means for preventing oscillation and for connecting said rail construction to said gamma-ray shielding member.

4,507,261

HANDLING PROCESS AND INSTALLATION FOR THE ASSEMBLIES OF A NEUTRON NUCLEAR REACTOR

Michel Aubert, Manosque, and Charley Renaux, Jouques, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 23, 1981, Ser. No. 286,275
Claims priority, application France, Aug. 14, 1980, 80 17961
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—270 **6 Claims**



1. Apparatus for handling the fuel assemblies is a fast neutron nuclear reactor, said nuclear reactor comprising:

(a) a vertically axed vessel;

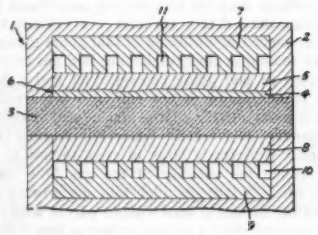
(b) a supporting grid for fuel assemblies disposed in said vessel;
(c) a core comprising a plurality of fuel assemblies removably positioned in a circular array in said supporting grid;
(d) a horizontal slab disposed over and sealing said vessel; and
(e) a handling pot for introducing said fuel assemblies into said vessel and for removing said fuel assemblies from said vessel,
said apparatus comprising:
(f) a large rotary plug mounted for rotation in said slab about a first vertical axis located over the center of said core;
(g) a small rotary plug mounted for rotation in said large rotary plug about a second vertical axis located over said core, said first and second vertical axes being spaced apart;
(h) a handling poker mounted on said small rotary plug at a point spaced from said second axis, said handling poker incorporating means for gripping one of said fuel assemblies, for lifting it free of the other fuel assemblies in said core, and for holding it while said small rotary plug is rotated; and
(i) a handling arm mounted on said large rotary plug for rotation about a third vertical axis located radially outwardly of said core, said handling arm extending radially by an amount which permits a working end thereof to be selectively positioned over an annular peripheral part of said core or over said handling pot, the working end of said handling arm incorporating means for gripping one of said fuel assemblies, for lifting it free of the other fuel assemblies in said core, for holding it while said large rotary plug is rotated and/or while said handling arm is rotated about said third vertical axis, and for depositing it in said handling pot,
whereby:
(j) said handling poker and said small rotary plug can be used to transfer fuel assemblies back and forth between the central part of said core and a take-up station located in the peripheral part of said core and
(k) said handling arm and said large rotary plug can be used to transfer fuel assemblies back and forth between the peripheral part of said core, including said take-up station, and said handling pot.

4,507,262

BUBBLE PRESSURE BARRIER AND ELECTRODE COMPOSITE

Bradley R. Karas, Clifton Park, and Charles E. Baumgartner, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 433,314, Oct. 7, 1982,. This application Apr. 5, 1984, Ser. No. 596,978
The portion of the term of this patent subsequent to Feb. 19, 2000, has been disclaimed.
Int. Cl.³ H01M 4/88
U.S. Cl. 419—2 **6 Claims**



1. A process for producing an integrally bonded electrode composite useful as an electrode in a molten carbonate fuel cell consisting essentially of a porous bubble pressure barrier integrally bonded to an electrode which consists essentially of the following steps:
(a) producing a porous bubble pressure barrier of predetermined pore size by forming metal oxide within its pores, said bubble pressure barrier having at least one face free of any significant amount of said metal oxide, which consists essentially of providing a porous sintered blank in the form of a plaque consisting essentially of a metal selected from the group consisting of nickel, copper, an alloy of nickel and copper, and an alloy of nickel and up to about 10 weight % chromium, said blank having a median pore size ranging from about 1 micron to about 10 microns, and a pore volume ranging from about 40% to about 75% by volume of the total volume of said blank, immersing said blank in a fluid organometallic precursor for a metal oxide selected from the group consisting of aluminum oxide, titanium oxide, iron oxide, zinc oxide and cerium oxide, subjecting said fluid to a vacuum sufficient to at least substantially evacuate the pores of said immersed blank and at least significantly fill said evacuated pores with said fluid, retrieving the resulting precursor-filled-blank, removing said precursor from at least one face of said blank leaving no significant amount thereof, infiltrating said precursor-filled blank with water or steam hydrolyzing said precursor within the pores of said blank producing a hydrolyzed product, first firing the resulting hydrolyzed product-containing-blank to convert said hydrolyzed product to said metal oxide leaving no significant amount of said hydrolyzed product therein at a temperature ranging from the temperature at which said product decomposes to said metal oxide to less than about 600° C., and second firing the resulting metal oxide-containing blank to remove any water which may be present therein at a temperature ranging from about 600° C. to about 700° C., said first and second firings being carried out at or about atmospheric pressure in a reducing atmosphere, said first and second firings having no significant deleterious effect on said bubble pressure barrier, and
(b) depositing a layer of an electrode-forming powder on said metal oxide free-face of said bubble pressure barrier, said electrode-forming powder covering said face and being coextensive therewith, said electrode-forming powder being selected from the group consisting of nickel, copper, an alloy of nickel and copper, and an alloy of nickel and up to about 10 weight % chromium, firing the resulting composite structure in a reducing atmosphere at or about atmospheric pressure, said electrode-forming powder sintering to form an electrode and simultaneously sintering to said barrier forming an integral bond therewith producing said integrally bonded electrode composite, said barrier having a median pore size significantly smaller than the median pore size of said electrode, said firing to form said electrode composite not exceeding the melting point of said composite.

4. A process for producing an integrally bonded electrode composite useful as an electrode in a molten carbonate fuel cell consisting essentially of a porous bubble pressure barrier integrally bonded to an electrode which consists essentially of the following steps:
(a) producing a porous bubble pressure barrier of predetermined pore size by forming metal oxide within its pores, said bubble pressure barrier having at least one face free of any significant amount of said metal oxide, which consists essentially of providing a porous sintered blank in the form of a plaque consisting essentially of a metal selected from the group consisting of nickel, copper, an alloy of nickel and copper, and an alloy of nickel and up to about 10 weight % chromium, said blank having a median pore size ranging from about 1 micron to about 10 microns, and a pore volume ranging from about 40% to about 75% by volume of the total volume of said blank, immersing said blank in a fluid organometallic precursor for a metal oxide selected from the group consisting of aluminum oxide,

titanium oxide, iron oxide, zinc oxide and cerium oxide, subjecting said fluid to a vacuum sufficient to at least substantially evacuate the pores of said immersed blank and at least significantly fill said evacuated pores with said fluid, retrieving the resulting precursor-filled-blank, removing said precursor from at least one face of said blank leaving no significant amount thereof, infiltrating said precursor-filled blank with water or steam hydrolyzing said precursor within the pores of said blank producing a hydrolyzed product, first firing the resulting hydrolyzed product-containing-blank to convert said hydrolyzed product to said metal oxide leaving no significant amount of said hydrolyzed product therein at a temperature ranging from the temperature at which said product decomposes to said metal oxide to less than about 600° C., and second firing the resulting metal oxide-containing blank to remove any water which may be present therein at a temperature ranging from about 600° C. to about 700° C., said first and second firings being carried out at or about atmospheric pressure in a reducing atmosphere, said first and second firings having no significant deleterious effect on said bubble pressure barrier, and

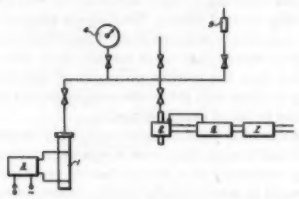
(b) providing a porous sintered electrode in the form of a plaque, said electrode being selected from the group consisting of nickel, copper, an alloy of nickel and copper, and an alloy of nickel and up to about 10 weight % chromium, contacting one face of said electrode coextensively with said metal oxide free-face of said bubble pressure barrier forming a composite structure, firing the resulting composite structure in a reducing atmosphere at or about atmospheric pressure sintering said barrier to said electrode forming an integral bond therewith, said bubble pressure barrier having a median pore size significantly smaller than the median pore size of said electrode, said firing to form said electrode composite not exceeding the melting point of said composite.

4,507,263

METHOD FOR PREPARING IMPROVED POROUS METAL-HYDRIDE COMPACTS

Moshe Ron, 35 Zamenhoff Str., Haifa 34602, Israel

Filed Jul. 29, 1983, Ser. No. 518,341
Claims priority, application Israel, Aug. 15, 1982, 66552
Int. Cl.³ F16N *15/08*
U.S. Cl. 419—48 **10 Claims**



1. A method for preparing improved porous metal hydride compacts consisting of a sintered metal-embedded porous metal hydride, the method comprising the steps of:

(a) preparing an intimate mixture, in powder form, of a finely divided hydridable metal alloy hydride and a finely divided metal;

(b) hydriding said powder by charging it with hydrogen, and

(c) sintering the hydrided metal-embedded metal hydride in a furnace wherein hydrogen is supplied at a pressure above equilibrium pressure appropriate to the prevailing temperature, and mechanical stress is applied simultaneously.

4,507,264

NICKEL BASE BRAZING ALLOY AND METHOD

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Filed Dec. 1, 1982, Ser. No. 445,818
Int. Cl.³ C22C *19/05*
U.S. Cl. 420—443 **6 Claims**

3. A nickel base diffusion brazing alloy for brazing gamma-gamma prime type nickel base superalloys at temperatures including about 2150° to 2300° F. and having improved uniformity of hardness at the microfillets of bonded joints and a thicker solid solution interface between the base metal and the brazed metal joint, consisting essentially of the following composition, in weight percent:

Element	Percentage
Chromium	12 to 14%
Tantalum	2 to 4%
Boron	2.5 to 4%
Yttrium	0.01 to 0.06%
Aluminum	2.5 to 5%

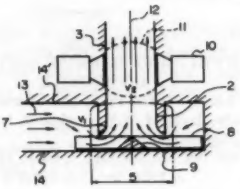
the brazing alloy having less than 0.03% carbon and the balance nickel, with incidental impurities, and wherein the chromium, aluminum and yttrium combine in the brazed joint to improve sulfidation and oxidation resistance.

4,507,265

APPARATUS FOR TREATING EFFLUENT GAS BY IRRADIATION WITH ELECTRON BEAMS

Tsutomu Higo; Shoji Mizutani, both of Chigasaki; Yasuhiro Sawada, Fuchu, and Katsumi Kengaku, Kitakyushu, all of Japan, assignors to Ebara Corporation and Shin Nippon Seitetsu K.K., both of, Japan

Continuation of Ser. No. 107,254, Dec. 26, 1979, abandoned.
This application May 3, 1982, Ser. No. 374,551
Claims priority, application Japan, Dec. 29, 1978, 53-162152
Int. Cl.³ G21K *5/00*
U.S. Cl. 422—186 **16 Claims**



1. An apparatus for treating an effluent gas by irradiation with electron beams comprising a gas introducing part comprising:

a guide passage duct for transporting an effluent gas from the source thereof to a gas inlet of a velocity reduction chamber placed downstream of said guide passage duct;

a velocity reduction chamber having said gas inlet directly connected to said guide passage duct and a gas outlet which is an opening at the end of a first vertical duct which extends into the central area of said velocity reduction chamber, said velocity reduction chamber consisting of a space sufficiently large in cross-section to substantially reduce the velocity of the gas flow introduced therein through said gas inlet, said space being enclosed by a bottom surface at least a major part of which consists of a horizontal plate, a ceiling surface at least a major part of which consists of a horizontal plate and at least one side wall surrounding the part of said first vertical duct which extends into the central area;

a velocity accelerating portion constituting said terminal

part of said first vertical duct extending into the central area of said velocity reduction chamber, said velocity accelerating portion having a cross sectional area which decreases in the direction of gas flow and thereby enables the velocity of gas flow once retarded in said velocity reduction chamber to substantially accelerate and at the same time contributes to the formation of such a velocity distribution of gas flow as is the most suitable for the gas flow to receive as even a dose as possible when it subsequently passes through an irradiation zone; and

a guide portion directly connected to said velocity accelerating portion downstream therefrom and constituting the subsequent part of said first vertical duct, said guide portion having a uniform cross sectional area, said guide portion in cooperation with said velocity accelerating portion accomplishing the formation of said most desirable velocity distribution, said guide portion leading the modified gas flow having an accelerated velocity and an adjusted velocity distribution to said irradiation zone;

a main body part comprising a second vertical duct directly connected to said guide portion, said main body part containing an irradiation zone which is a place inside the second vertical duct wherein said modified gas flow is irradiated with electron beam emitted from a plurality of electron beam accelerators placed outside the second vertical duct and around the irradiation zone; and

a gas discharging part comprising an outflow duct, directly connected to the second vertical duct containing said irradiation zone, for transporting the irradiated effluent gas containing aerosol solids produced by irradiation to a dust collector for purifying the gas, said discharging duct containing at least three rectangular bends between said irradiation zone and said dust collector to cut off Bremsstrahlung x-rays coming from the irradiation zone and electron beam accelerators.

4,507,266

GLOW DISCHARGE GENERATING APPARATUS

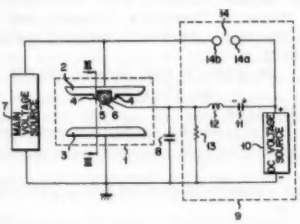
Saburoh Satoh, Kawasaki; Tatumi Gotoh, Yamato; Kenji Horii, Aichi, and Hidenori Akiyama, Nagoya, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 9, 1983, Ser. No. 473,635

Claims priority, application Japan, Mar. 10, 1982, 57-37753

Int. Cl.³ C01B *13/11*

U.S. Cl. 422—186.15 **3 Claims**



1. A glow discharge generating apparatus, comprising:

a glow discharge chamber housing an anode and a cathode disposed opposite to each other;

a main voltage source, connected at its negative terminal to said cathode and at its positive terminal to said anode, for supplying a pulse voltage of a predetermined waveform to generate a glow discharge between said anode and said cathode;

triggering means, comprising a triggering electrode disposed adjacent to said cathode and a first capacitor connected between said triggering electrode and said anode, for starting said glow discharge; and

circuit means for stabilizing said glow discharge, including:

a DC voltage source connected at its negative terminal to said anode,

a series circuit, including a second capacitor and an inductance coil, connected between a positive terminal of said DC voltage source and said triggering electrode, and

a gap switch, connected between said positive terminal of said DC voltage source and said cathode through which said second capacitor discharges, wherein

a damped oscillating current for a predetermined period of time within the period of time of said glow discharge is produced by a series loop constituted by said second capacitor, said gap switch, said cathode, said triggering electrode and said inductance coil.

4,507,267

HEAT-AIDED METHOD FOR SEPARATING THE GRAPHITE MATRIX FROM THE NUCLEAR FUEL OF NUCLEAR REACTOR FUEL ELEMENTS

Hans-Klemens Hinssen, Nettetal; Werner Katscher, Jüich; Karl-Josef Loenissen, Jülich; Rainer Moormann, Jülich; Heinz Seeboth, Hückelhoven; Bernhard Stauch, Jülich, and Josef Thelen, Titz, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,518

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149795

Int. Cl.³ G21C *19/42;* **C01G** *56/00*

U.S. Cl. 423—4 **9 Claims**

1. Method for separation and removal of the encasing graphite from the nuclear fuel of gas-cooled high-temperature reactors by treatment with oxygen-containing gas at elevated temperature, comprising the steps of:

maintaining said fuel elements in a furnace at a temperature between 200° C. and 700° C. in an atmosphere of oxygen-containing gas for a period sufficient to produce the loosening up of the carbon or graphite structure thereof without burning more than 25% of the carbon so as to form a mechanically separable substance, and

separating the loosened layers of said carbon or graphite structure by mechanical attack.

4,507,268

SOLVENT EXTRACTION

Gary A. Kordosky, Tucson, Ariz.; Kenneth D. Mackay, Plymouth, Minn.; R. Brantley Sudderth, and Joseph M. Sierakoski, both of Tucson, Ariz., assignors to Henkel Corporation, Minneapolis, Minn.

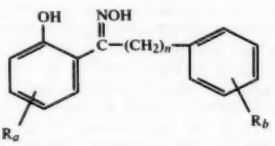
Continuation-in-part of Ser. No. 340,991, Jan. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 500,041, Jun. 7, 1983, abandoned. This application Mar. 23, 1984, Ser. No. 592,828

Int. Cl.³ C01G *3/00*

U.S. Cl. 423—24 **38 Claims**

1. A reagent composition comprising:

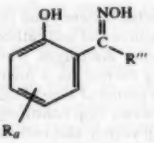
(a) one or more hydroxy aryl ketoxime compounds of Formula I or II,



(I)

in which R and R′ may be individually alike or different and are saturated aliphatic groups of 1–25 carbon atoms, ethylenically unsaturated aliphatic groups of 3–25 carbon atoms or —OR″ where R″ is a saturated or ethylenically

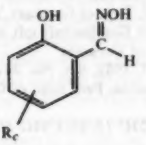
unsaturated aliphatic group as defined; n is 0 or 1; and a and b are each 0, 1, 2, 3 or 4, with the proviso that both are not 0 and the total number of carbon atoms in R_a and R'_b is from 3 to 25,



(II)

in which R and a are as defined with respect to Formula I and R''' is a saturated aliphatic group of 1–25 carbon atoms or an ethylenically unsaturated aliphatic group of 3–25 carbon atoms, with the proviso that the total number of carbon atoms in R_a and R''' is from 3 to 25;

(b) one or more hydroxy aryl aldoxime compounds of Formula III,



(III)

in which R is as defined above with respect to Formulas I and II, c has a value of 1, 2, 3 or 4, and the total number of carbon atoms in R_c is from 3 to 25;

(c) a kinetic additive substance in an amount of from 0 to 20 mole percent based on hydroxy aryl ketoxime present; and,

(d) an extraction and stripping equilibrium modifier substance in an amount providing for a degree of modification of the hydroxy aryl aldoxime present of from about 0.75 to about 1.0,

the mole ratio of hydroxy aryl ketoxime present to hydroxy aryl aldoxime present being from 1:100 to 100:1.

4,507,269

NON-CATALYTIC METHOD FOR REDUCING THE CONCENTRATION OF NO IN COMBUSTION EFFLUENTS BY INJECTION OF AMMONIA AT TEMPERATURES GREATER THAN ABOUT 1300 DEGREE K

Anthony M. Dean, Hampton; Anthony J. DeGregoria, Englewood; James E. Hardy, Lebanon; Boyd E. Hurst, Long Valley, and Richard K. Lyon, Pittstown, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1983, Ser. No. 550,398

Int. Cl.³ C01B *21/00*

U.S. Cl. 423—235 **9 Claims**

1. In a process for reducing NO concentration of a combustion effluent wherein ammonia is injected into a flowing combustion effluent containing NO and at least 0.1 volume percent oxygen when at least a portion of the effluent is at a temperature within the range of about 1300° K. to 1600° K. and wherein the combustion effluent passes through at least one cooling zone in which it is cooling at a rate of at least about 250° K. per second, the improvement which comprises injecting ammonia into the combustion effluent at a point where the combustion effluent: (a) is at a temperature of about 1300° K. to 1600° K. and (b) is cooling at a rate of at least about 250° K. per second, wherein the amount of ammonia injected is such that a reduction of NO in the combustion effluent is realized.

4,507,270

PROCESS FOR THE PREPARATION OF LEAD AND ZINC CYANURATES

Hubert Harth; Martin Witthaus, both of Dusseldorf, and Wolfgang Gress, Wuppertal, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,672

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224766

Int. Cl.³ C01C *3/00*

U.S. Cl. 423—365 **4 Claims**

1. A process for the preparation of lead or zinc cyanurate by the reaction of PbO or ZnO, respectively, with cyanuric acid in the presence of water and in the absence of a catalyst, wherein the PbO or ZnO and cyanuric acid are mixed together with an amount of water sufficient only to form a paste thereof that can be kneaded, the paste having a moisture content of between 10 and 80% by weight, calculated with regard to the paste, and said paste is subjected to shearing forces at a temperature between 50° and 250° C.

4,507,271

REMOVAL OF NITROUS OXIDE FROM GASES CONTAINING HYDROGEN, NITRIC OXIDE AND NITROUS OXIDE

Frans Van Deyck, Essen, Belgium; Franz-Josef Weiss, Neuhofen, Fed. Rep. of Germany; Roger Verberckt, Schelle, Belgium; Erwin Thomas, Freinsheim, Fed. Rep. of Germany; Benedikt Mangelschots, Berchem, and Paul Pijl, Kalmthout, both of Belgium, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,396

Int. Cl.³ C01B *21/14*

U.S. Cl. 423—387 **9 Claims**

1. A process for preparing hydroxylammonium salts comprising the steps of treating a gas containing hydrogen, nitric oxide and nitrous oxide with molecular sieves to remove nitrous oxide therefrom, and then catalytically reducing the nitric oxide with hydrogen in the treated gas in the presence of a strong mineral acid to form hydroxylammonium salts.

4,507,272

METHOD OF PURIFYING PARTIALLY CARBONIZED PAN MATERIAL PRIOR TO CARBONIZATION

Charles K. Mullen, Anaheim; Gary D. Shepherd, Redondo Beach; Ramon B. Fernandez, Torrance, and Kenneth B. Bergren, Hawthorne, all of Calif., assignors to Hitco, Newport Beach, Calif.

Filed May 9, 1983, Ser. No. 493,075

Int. Cl.³ D01F *9/22*

U.S. Cl. 423—447.4 **8 Claims**

1. A method of producing purified carbonized material from oxidized polyacrylonitrile precursor material comprising the steps of:

providing a quantity of oxidized polyacrylonitrile precursor material;

partially carbonizing the oxidized polyacrylonitrile precursor material to provide partially carbonized material;

treating the partially carbonized material to remove alkali and alkaline earth metal impurities therefrom and provide purified material and including the steps of contacting the partially carbonized material with an aqueous acid solution and thereafter rinsing the partially carbonized material with a solvent which is substantially free of alkali and alkaline earth metal ions, and

processing the purified material to provide substantially complete carbonization thereof;

the step of partially carbonizing the oxidized material comprising heating the oxidized material to 460°–650° C., and the step of processing the purified material to provide substantially complete carbonization thereof comprising

heating the purified material to a temperature of at least about 1000° C.

4. A method of producing purified carbonized fibers from fibers of polyacrylonitrile precursor material comprising the steps of:

providing fibers of polyacrylonitrile precursor material;

passing the fibers through an oxidizing oven to oxidize the fibers;

passing the oxidized fibers through a precarbonization furnace to partially carbonize the fibers;

weaving the partially carbonized fibers into a fabric;

treating the fabric to remove alkali and alkaline earth metal impurities therefrom comprising contacting the fabric with an aqueous acid solution at an elevated temperature and thereafter rinsing the fabric; and

thereafter passing the fabric through a carbonization furnace to substantially completely carbonize the fabric;

the step of passing the oxidized fibers through a precarbonization furnace to partially carbonize the fibers comprising passing the oxidized fibers through a first section of a precarbonization furnace heated to about 460° C. for about 1 minute and through a second section of the precarbonization furnace heated to about 650° C. for about 1 minute, and the step of passing the fabric through a carbonization furnace to substantially completely carbonize the fabric comprising passing the fabric through a carbonization furnace at a temperature of about 1070° C. for about 1 minute.

4,507,273

OXIDATION PROCESS FOR PRODUCTION OF ACIDIC FERRIC SULPHATE

William G. Hudson, Grimsby, England, assignor to Tioxide Group PLC, United Kingdom

Filed May 24, 1983, Ser. No. 497,597

Claims priority, application United Kingdom, Jul. 24, 1982, 8221453

Int. Cl.[3] **C01G** *41/14*

U.S. Cl. 423—558 **10 Claims**

1. A process for the production of an acidic ferric sulphate which comprises:

(a) establishing a bed of ferrous sulphate heptahydrate and passing a heated gas through the bed to fluidize the bed and to heat the said ferrous sulphate to a temperature of from 32° C. to 38° C. to produce a free flowing and substantially aggregate-free product,

(b) increasing the temperature of the fluidized $FeSO_4.7H_2O$ to a value within the range 40° C. to 50° C. to commence to remove water of crystallization of said $FeSO_4.7H_2O$,

(c) when the amount of water of crystallization has fallen to less than 6 mols H_2O per mol $FeSO_4$ increasing the temperature to a value of from 54° C. to 65° C. to complete the reduction of the amount of water of crystallization to produce a partially dehydrated product containing from 3.8 to 5.2 mols H_2O per mol $FeSO_4$ while maintaining the material in steps (b) and (c) in fluid suspension,

(d) heating the partially dehydrated product to a temperature of from 150° C. to 300° C. while maintaining the partially dehydrated product in fluid suspension by passing through the product an oxygen containing gas to oxidize at least 85% by weight Fe^{2+} to Fe^{3+},

(e) adding to the oxidized product concentrated sulphuric acid in an amount sufficient to increase the mole ratio SO_4:Fe^{3+} to at least 1.5:1 while maintaining the product in fluid suspension and at a temperature of 120° C. to 220° C., and

(f) cooling the oxidized and acidified product while maintaining the product in fluid suspension to produce a solid free-flowing ferric sulphate having a mole ratio SO_4:Fe^{3+} of at least 1.5:1.

4,507,274

DESULFURIZATION OF H_2S-CONTAINING GASES

Franz J. Broecker, Ludwigshafen; Hans Gettert, Gross-Sachsen, and Knut Kaempfer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,533

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208695

Int. Cl.[3] **C01B** *17/02;* **B01J** *8/02*

U.S. Cl. 423—573 R **9 Claims**

1. A process for the desulfurization of an H_2S-containing gas by direct catalytic oxidation of the H_2S to elementary sulfur which comprises:

(a) passing a mixture of the H_2S-containing gas and an oxygen-containing gas through the tubes of a tube reactor and

(b) contacting said mixture with a catalyst containing one or more metals selected from the group of iron, cobalt, nickel, molybdenum or their sulfides or oxides said catalyst being present in the tubes of the tube reactor and filling the tubes over the entire cross-section of the tubes;

(c) indirectly removing the heat of reaction by means of water or an organic heat transfer oil as a coolant, said coolant being present in the jacket space around the tubes of the tube-reactor;

(d) taking the gaseous reaction mixture containing the sulfur formed from the tube-reactor keeping the exit temperature of the gaseous reaction mixture at 220° to 320° C.;

(e) passing the gaseous reaction mixture through a condensation stage downstream of the tube reactor and

(f) separating out the sulfur of the reaction mixture in said condensation stage.

4,507,275

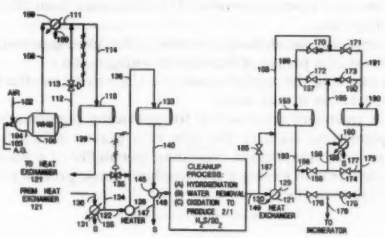
PROCESS FOR PRODUCING AND RECOVERING ELEMENTAL SULFUR FROM ACID GAS

Robert L. Reed, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 30, 1983, Ser. No. 527,909

Int. Cl.[3] **C01B** *17/04;* **B01D** *53/36;* **B01J** *8/04*

U.S. Cl. 423—574 R **12 Claims**



1. In an improved modified Claus process of the type including the steps of reacting acid gas and air in a thermal reaction zone, reacting the resulting gas in four catalytic reaction zones arranged in series and maintained at progressively reduced temperatures, sulfur being removed in cooling zones between said reaction zones, the last two of said catalytic reaction zones being maintained below the dew point of sulfur, sulfur being deposited on the catalyst, the improvement comprising:

(a) hydrogenating the gas prior to passing it to said last two catalytic reaction zones;

(b) removing water from said gas prior to passing it to said last two catalytic reaction zones;

(c) oxidizing a portion of said gas to produce a stoichiometric mixture of H_2S and SO_2; then

(d) when the catalyst loading in one of said last two catalytic reaction zones exceeds a predetermined level, heating the

effluent subjected to steps (a), (b) and (c) to produce a regenerating gas;

(e) feeding said regenerating gas to said one catalytic reaction zone until the catalyst is regenerated then cooling said gas to remove sulfur and passing said gas to the second of the two catalytic reaction zones, said second catalytic reaction zone being maintained below the dew point of sulfur, steps (d) and (e) being carried out only for as long as necessary to regenerate the catalyst.

4,507,276

ANALGESIC CAPSULE

Thomas M. Tencza, Wallington, and Mahesh K. Patell, Edison, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 20, 1982, Ser. No. 410,167
Int. Cl.³ A61K *9/48, 31/60*
U.S. Cl. 424—37 **10 Claims**

1. As an article of manufacture, a therapeutically effective dose of aspirin and APAP in capsule form; said dose comprising a therapeutically effective amount of enteric coated aspirin granules and APAP in powdered form; said dose being designed to provide APAP available for immediate absorption into the bloodstream from the stomach and aspirin and aspirin for delayed absorption into the bloodstream from the intestines whereby the danger of gastric intolerance due to the presence of aspirin in the stomach is significantly diminished or eliminated.

4,507,277

COMPOSITION AND METHOD FOR STIMULATING THE SYNTHESIS OF THE MELANOTIC PIGMENT OF THE SKIN

Carlos M. M. Cao, and Manuel T. Gonzalez, both of Miramar, Cuba, assignors to Empresa Cubana Importadora Y Exportadora de Productos Medicos, Havana, Cuba

Filed Apr. 8, 1983, Ser. No. 483,283
Int. Cl.³ A61K *7/42, 35/12, 35/48, 37/00*
U.S. Cl. 424—59 **6 Claims**

1. A method for the treatment of vitiligo comprising:

(a) isolating protein consisting essentially of alpha-lipoprotein from placental cotyledons, said alpha-lipoprotein having a spectrophotometric protein peak from 20 to 150 mcg./ml.;

(b) applying the alpha-lipoprotein to the non-pigmented skin areas of a person afflicted with vitiligo; and

(c) exposing the applied areas to a UV source to effect pigmentation in said areas.

5. A treatment composition for providing pigmentation to non-pigmented areas of the skin of a person afflicted with vitiligo, said composition consisting essentially of a placental alpha-lipoprotein having a spectrophotometric protein peak of 20 to 150 mcg./ml.

4,507,278

LOW AMMONIA BLEACH COMPOSITIONS

Richard DeMarco, Danbury, Conn., and John A. Ferguson, Cincinnati, Ohio, assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 112,036, Jan. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 950,922, Oct. 12, 1978, abandoned. This application Jun. 17, 1982, Ser. No. 389,522
Int. Cl.³ A61K *7/135, 7/06*
U.S. Cl. 424—62 **17 Claims**

1. An aqueous thickened low ammonia hair bleaching composition comprising based on the total composition:

(a) from about 1.5% to about 7% by weight of hydrogen peroxide;

(b) from about 17% to about 27% by weight of at least one water-soluble surfactant thickener selected from the group consisting of

(i) an alkylene glycol or an alkylene glycol ether alcohol of the formula:

$$R^5O(R^6O)_nR^7OH$$

wherein R^5 is H or alkyl having 1 to 4 carbon atoms and R^6 and R^7 are divalent alkylene radicals having 2 to 4 carbon atoms and n is a number from 1 to 150;

(ii) a long chain fatty acid soap of the formula:

$$(R^8COO)_aM$$

wherein R^8 is the hydrocarbon moiety of a long chain fatty acid having 10 to 20 carbon atoms, M is a monovalent or polyvalent salt-forming group and "a" is the valence of group M;

(iii) a long chain polyoxyalkylated compound selected from the group consisting of a polyoxyalkylated long chain fatty alcohol, a polyoxyalkylated polyhydroxyalkyl ester of a long chain fatty acid; a polyoxyalkylated long chain fatty acid; a polyoxyalkylated long chain fatty acid amide; a polyoxyalkylated long chain alkylphenol and polyoxyalkylated laurate esters of sorbitol and its anhydrides containing about 8 to 300 oxyalkyl groups in the structure; and

(iv) mixtures thereof;

(c) from about 4% to about 13% by weight of a water-insoluble surfactant thickener selected from the group consisting of polyethylene glycol (6 moles ethylene oxide) ether of tridecyl alcohol; ethoxylated nonylphenol (4.0 moles of ethylene oxide); cetyl alcohol; polyethylene glycol (5 moles ethylene oxide) ester of oleic acid; polyethylene glycol amine of soya acid (5.0 moles ethylene oxide); ethylhydroxymethyl oleyl oxazoline and mixtures of the above;

(d) sufficient non-hair damaging alkalizing agent to give the composition a pH of from about 9 to 12 and selected from the group consisting of alkali metal metasilicates; alkali metal carbonates; ortho-, meta and tri-polyphosphates and alkali metal silicates;

(e) from about 2% to about 20% by weight of at least one percompound selected from the group consisting of an ammonium-, alkali metal- and alkaline earth metaperborate, persulfate, percarbonate, and carbonate peroxide;

(f) wherein the ammonium ion concentration is in the range of from about 0.15% to about 0.55% by weight whereby only trace amounts of ammonia gas are produced as a result of interaction of these ingredients with each other or with hair; and

(g) wherein the ratio of water-soluble surfactant thickener to water-insoluble surfactant thickener is in the range of from about 1.8 to about 7.0;

(h) said composition being very low in ammonia concentration giving substantially no ammonia odor but being sufficiently active to give adequate bleaching with an acceptable level of hair damage, said composition also having a viscosity sufficiently high when applied to the hair on the head so that it does not run down the head.

4,507,279

COSMETIC COMPOSITIONS OF THE OIL-IN-WATER EMULSION TYPE

Genichiro Okuyama; Shizume Takemoto, and Yasuhisa Otani, all of Odawara, Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 92,140
Claims priority, application Japan, Nov. 11, 1978, 53-139095
Int. Cl.³ A61K *7/021, 47/00*
U.S. Cl. 424—63 **12 Claims**

1. In a skin cosmetic composition which is an oil-in-water emulsion consisting essentially of from 25 to 90% by weight of water, as the continuous phase; from 0.5 to 60% by weight of cosmetic oil material, as the discontinuous phase, said oil mate-

rial having no free carboxyl groups and being safe and effective for cosmetic use on the human skin; and an emulsifier in an amount effective to maintain in a stable condition the oil-in-water emulsion of said oil material in said water, the improvement which comprises: said emulsifier is selected from the group consisting of

(a) a mixture of from 0.5 to 10% by weight of basic polypeptide, based on the total weight of said cosmetic composition, and higher fatty acid having from 12 to 22 carbon atoms, the amount of said higher fatty acid being from 0.2 to 30 times the amount of said basic polypeptide, said basic polypeptide consisting of a partial hydrolyzate of naturally occurring protein and having an average molecular weight of from 450 to 10,000, an isoelectric point of from 8.5 to 10.5 and an amino acid composition, derived from said naturally occurring protein, characterized by a ratio of basic amino acids to acidic amino acids in the range of from 1.05 to 3.0, and

(b) from 1.0 to 20.0% by weight, based on the total weight of said cosmetic composition, of salt of said basic polypeptide and said higher fatty acid, wherein the amount of said higher fatty acid used to prepare said salt is from 0.2 to 30 times the weight of said basic polypeptide used to prepare said salt.

4,507,280

HAIR CONDITIONING COMPOSITION AND METHOD FOR USE

Stanley Pohl, New Rochelle; Michael Hnatchenko, Bronx, both of N.Y., and Raymond Feinland, Stamford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 196,716, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 080,615, Oct. 1, 1979, abandoned. This application Feb. 12, 1982, Ser. No. 348,390

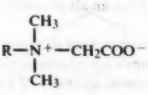
Int. Cl.[3] **A61K** *7/06, 7/09*

U.S. Cl. 424—70 **16 Claims**

1. A composition for the conditioning of hair treated with an alkaline medium prior to the conditioning, consisting essentially of, based on the total weight of the composition, from about 0.1% to about 10% of at least one cationic polymer product, from about 0.2% to about 20% of at least one amphoteric surfactant product, and sufficient acid to give the composition a pH in the range of from about 1 to about 6, wherein the ratio

$$\alpha = \left[\frac{\text{polymer (mer)}}{\text{detergent (mol)}}\right]$$

is from about 0.2 to about 5, in an aqueous carrier, and from about 0.1% to about 5.0% of at least one betaine of the formula:



in which R is a long chain aliphatic radical containing 10 to 24 carbon atoms.

4,507,281

INTERFERON-CONTAINING COMPOSITIONS

Samuel S. Asculai, East Meadow, N.Y., and Fred Rapp, Hershey, Pa., assignors to Exovir, Inc., Great Neck, N.Y.

Continuation of Ser. No. 311,035, Oct. 13, 1981, abandoned. This application Oct. 28, 1983, Ser. No. 546,573

Int. Cl.[3] **A61K** *45/02;* **C12P** *21/00*

U.S. Cl. 424—85 **19 Claims**

1. A therapeutic composition for treating herpes simplex viral infections in humans, comprising an effective amount of human interferon, an effective amount of nonylphenoxypolyethoxyethanol, and a physiologically acceptable carrier.

10. A method for treating herpes simplex viral infections in humans, comprising topically administering to an affected area an effective amount of a therapeutic composition comprising human interferon, nonylphenoxypolyethoxyethanol, and a physiologically acceptable carrier.

4,507,282

HIGH MOLECULAR WEIGHT ANTITUMOR ANTIBIOTIC AN-7D

Shigezo Udaka; Shigeyoshi Miyashiro, both of Nagoya; Eikou Shimizu, Kawasaki, and Tsuyoshi Shiio, Kamakura, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 387,253, Jun. 10, 1982, abandoned. This application Jun. 10, 1983, Ser. No. 502,531 Claims priority, application Japan, Jun. 10, 1981, 56-89316

Int. Cl.[3] **A61K** *35/74*

U.S. Cl. 424—117 **1 Claim**

1. A high molecular weight antibiotic AN-7D having the following characteristics:

(a) molecular weight: 12400～12500: (by gel-filtration and SDS-polyacrylamide gel electrophoresis methods);

(b) appearance: white amorphous powder;

(c) coloration reaction: positive to ninhydrin and biuret reaction, negative to anthrone and Blix reaction;

(d) solubility: soluble in water, insoluble in ethanol, acetone, propanol and butanol;

(e) ultraviolet spectrum: as shown in FIG. 1;

(f) infrared spectrum: as shown in FIG. 2;

(g) elemental analysis: C: 46～47%, H: 6.0～7.0% S: 1-2%, O: 30-31%, N: 12～13%;

(h) amino acid composition: as shown in Table 5;

(i) isoelectric point: 3.5 (by isoelectric point electrophoresis)

(j) antimicrobial activity: positive against
Bacillus subtilis ATCC 663,
Sarcina lutea ATCC 9341 and
Streptococcus aureus FDA 209 P;

(k) antitumor activity: positive against mouse leukemia cells L 1210, P 388 and P 1534.

4,507,283

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Richard A. G. Smith, Reigate, England, assignor to Beecham Group p.l.c., England

Filed Apr. 5, 1983, Ser. No. 482,136

Claims priority, application United Kingdom, Apr. 7, 1982, 8210262

Int. Cl.[3] **A61K** *37/48;* **C12N** *9/96, 9/48, 9/70, 9/68*

U.S. Cl. 424—94 **16 Claims**

1. A derivative of streptokinase-human plasminogen activator complex in which the active catalytic site essential for fibrinolytic activity is blocked by a 2- or 4-aminobenzoyl group which is optionally substituted in the aromatic ring by an electron donating moiety, the group being removable by hydrolysis such that the first order rate constant for hydrolysis of the derivative is in the range 0.7×10^{-5} sec^{-1} to 2.5×10^{-5} sec^{-1} in isotonic aqueous media at pH 7.4 at 37° C.

4,507,284

SOIL DISINFECTANT

Yoshimi Yamada, Hyogo; Tadashi Ooishi, Osaka; Toshiro Kato, and Kunio Mukai, both of Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 210,618, Nov. 26, 1980, Pat. No. 4,366,150. This application Aug. 30, 1982, Ser. No. 413,141

Claims priority, application Japan, Nov. 29, 1979, 54-155061; Apr. 30, 1980, 55-58477

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ A01N *57/00*

U.S. Cl. 514—140 11 Claims

1. A method for preventing and controlling diseases caused by pathogenic fungi living in soil, which comprises applying an effective amount of phenylphosphinic acid or its salt to the soil where the pathogenic fungi are living.

4,507,285

STABILIZED ACTIVATED OXYGEN AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAID STABILIZED ACTIVATED OXYGEN

Friedrich-Wilhelm Kühne, Paulinenstrasse 56, D-7107 Neckarsulm, Fed. Rep. of Germany

Filed Apr. 7, 1983, Ser. No. 482,846

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213389

Int. Cl.³ A61K *33/40*

U.S. Cl. 424—130 4 Claims

1. Stabilized activated oxygen which is enclosed in a matrix consisting of chlorite ions as represented by the general formula

$$ClO_2^- \times nO_2 \text{ (activated)}$$

wherein n has the value 0.1–0.25, having an O_2 band at 1562 cm^{-1} in the Raman spectrum and an O-O interval of 123 pm, obtained by reacting a chlorite in an aqueous solution with a hypochlorite in a molar ratio between chlorite and hypochlorite of 1:0.2 to 1:0.3, titrating the obtained alkaline solution with chloryl sulfuric acid to a pH value of 6.4–6.8 to form chlorine dioxide and a charge-transfer-complex $(Cl_2O_4)^-$, expelling chlorine dioxide from this complex by addition of a peroxide selected from the group consisting of peroxide carbonates and peroxide borates, adding sodium peroxide, permitting the reaction mixture to stand for at least 4 weeks, and separating the resultant aqueous solution containing the complex of activated oxygen and chlorite ions from the carbonate or borate which precipitates from the reaction mixture.

4,507,286

POLYSACCHARIDE HAVING ANTIINFLAMMATORY AND PLATELET ANTIAGGREGATION ACTIVITY

Massimiliano Vellini, Saronno, Italy, assignor to Rorer Italiana, S.P.A., San Fruttuoso di Monza, Italy

Filed Mar. 17, 1983, Ser. No. 476,230

Claims priority, application Italy, Mar. 22, 1982, 20313 A/82; Feb. 18, 1983, 47744 A/83

Int. Cl.³ A61K *31/715;* C08B *37/00*

U.S. Cl. 514—23 8 Claims

1. The product with antiinflammatory and platelet antiaggregation activity obtained from bromelain or the juice of plants of the family Bromeliaceae, having an activity in the amount of 5–5000 picograms per unit dose, having the following characteristics:

substantially polysaccharidic nature and substantially protein-free;

degradation point higher than 280° C.;

and α_D value stabilized after a few hours in solution ranging from +120° and +140°;

a retention time of 8.2 min. in HPLC on C18 Bondapack column 300 mm×4 (15,000 plates/m) at a flow-rate of 1 ml/min. of water as eluent;

a C^{13} NMR spectrum showing signals at 99.6, 76.8, 73.4, 71.5, 71.1, and 60.5 ppm;

a H^1-NMR spectrum according to FIG. 2;

an IR spectrum according to FIG. 3, having broad bands in the region 3600–3000 and 1200–1000 cm^{-1};

an elementary composition of about C=45%; H=6%; O=48%, Na from 0 to 2%.

6. A pharmaceutical composition having antiinflammatory and platelet antiaggregant activity which contains as the active principle a therapeutically effective amount of the product of claim 1 and at least one inert carrier.

4,507,287

PREPARATION AND METHOD FOR THE TREATMENT OF ACNE

Glen J. Dixon, 1476 Stoneleigh Hills Rd., Lithonia, Ga. 30058

Filed Jun. 20, 1983, Ser. No. 505,784

Int. Cl.³ A61K *31/70*

U.S. Cl. 514—43 1 Claim

1. A method for treating acne in humans comprising the step of topically applying to acne papules or pustules present on the skin of said humans a preparation comprising a solvent carrier being between 50 percent and 100 percent dimethylsulfoxide which will translocate through the skin and penetrate cell walls and an antibacterial agent being between 0.1 percent and 10.0 percent of the preparation and selected from the group consisting of ara-A, acyclovir, and ribavirin.

4,507,288

β-GLYCEROPHOSPHATE SALTS OF ANTIMALARIAL PHENANTHRENEMETHANOL COMPOUNDS

Jean F. Rossignol, Philadelphia, Pa., assignor to Smithkline Beckman Corporation, Philadelphia, Pa.

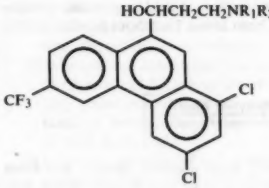
Filed Sep. 16, 1983, Ser. No. 533,019

Int. Cl.³ A61K *31/685;* C07C *9/11*

U.S. Cl. 514—143 7 Claims

1. A compound represented by the following structural formula (I):

(I)



wherein R_1 is hydrogen or an alkyl radical containing one to six carbon atoms and R_2 is an alkyl radical containing one to six carbon atoms.

7. A method for the treatment of malaria in a subject in need of said treatment comprising administering orally or by injection a nontoxic antimalarial quantity of a compound of claim 1.

4,507,289

TREATMENT OF DIABETES AND OTHER SYMPTOMS OF HYPERCORTICOIDISM USING A SYNERGISTIC COMBINATION OF ETIOCHOLANOLONES AND ESTROGEN

Douglas L. Coleman, Seal Harbor, Me., and Norman Applezweig, New York, N.Y., assignors to Progenics, Inc., New York, N.Y. and The Jackson Laboratory, Bar Harbor, Me.

Filed Dec. 28, 1983, Ser. No. 566,222

Int. Cl.³ A61K *31/56*

U.S. Cl. 514—170 20 Claims

1. A method of treating diabetes syndromes and associated hypertcorticoidism which comprises administering to a mam-

mal a diabetes and associated hypercorticoidism antagonizing effective amount of a synergistic combination of 5-β-androstan-3-ol-17-one compound and estrogen selected from the group consisting of the estradiol, estrone and its conjugates, androstendiol, the 17-acetylene derivatives of estradiol and the esters of estradiol.

4,507,290

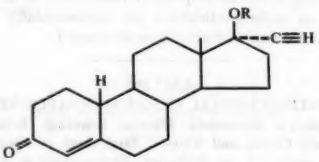
ESTERS OF 17 α-ETHYNYL 19-NOR-TESTOSTERONE AND 17 α-ETHYNYL-18-HOMO-19-NOR-TESTOSTERONE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Sydney Archer, Troy, N.Y.; Giuseppe Benagiano, Rome, Italy; Pierre Crabbé, Paris, France; Egon Diczfalusy, Stockholm, Sweden; Carl Djerassi, Stanford, Calif., and Josef Fried, Chicago, Ill., assignors to World Health Organization, Geneva, Switzerland

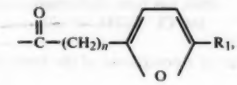
Filed Apr. 7, 1981, Ser. No. 251,914
Int. Cl.³ A61K *31/56*
U.S. Cl. 514—172 **21 Claims**

1. A steroid ester selected from the group consisting of

(a) an ester of D-17α-ethynyl-19-nor-testosterone having the formula



wherein R is selected from the group consisting of (1)

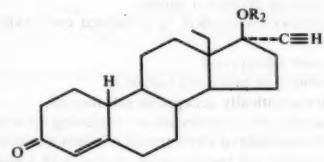


wherein R_1 is lower alkyl and n is 1–6, and

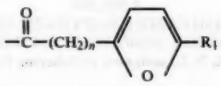
(2) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–8 carbon atoms in the ring, said ring being substituted by alkyl having 1–8 carbon atoms;

(b) the corresponding oxime of the ester defined in (a);

(c) an ester of levo-norgestrel having the formula



wherein R_2 is selected from the group consisting of (i)



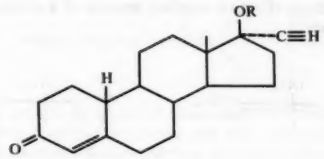
wherein R_1 is lower alkyl and n is 1–6, and (ii) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–6 carbon atoms in the ring;

(d) the corresponding oxime of the ester defined in (c);

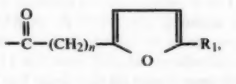
(e) and the oxime of an ester of levo-norgestrel having the formula in (c) wherein R_2 is acyl derived from an aliphatic carboxylic acid containing 4 or 5 carbon atoms.

18. A pharmaceutical composition for suppressing fertility comprising a fertility suppressing amount of a steroid ester in combination with a pharmaceutically acceptable carrier, said steroid ester being selected from the group consisting of

(a) an ester of D-17-α-ethynyl-19-nortestosterone having the formula



wherein R is selected from the group consisting of (1)

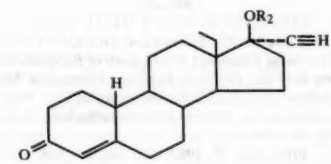


wherein R_1 is lower alkyl and n is 1–6, and

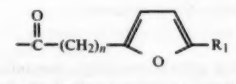
(2) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–8 carbon atoms in the ring, said ring being substituted by alkyl having 1–8 carbon atoms;

(b) the corresponding oxime of the ester defined in (a);

(c) an ester of levo-norgestrel having the formula



wherein R_2 is selected from the group consisting of (i)



wherein R_1 is lower alkyl and n is 1–6, and

(ii) acyl derived from an alicyclic carboxylic acid wherein the alicyclic moiety has 3–6 carbon atoms in the ring;

(d) the corresponding oxime of the ester defined in (c); and

(e) the oxime of an ester of levo-norgestrel having the formula in (c) wherein R_2 is acyl derived from an aliphatic carboxylic acid containing 4 or 5 carbon atoms.

4,507,291
ARTHROPOD REPELLENTS

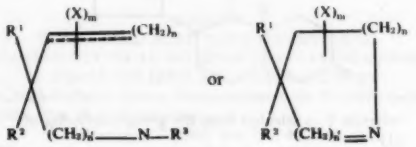
Joel R. Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 221,089, Dec. 29, 1980, Pat. No. 4,357,471, which is a division of Ser. No. 29,491, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 839,159, Oct. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 751,932, Dec. 17, 1976, abandoned. This application Jul. 15, 1982, Ser. No. 398,504

Int. Cl.[3] **A01N** *43/00, 43/40, 43/36*

U.S. Cl. 514—278 **17 Claims**

1. A method for repelling arthropods which comprises applying to the loci to be freed or protected from attack by arthropods an effective repellent amount of a compound selected from:



wherein R^1 is hydrogen, lower alkyl of from 1 to 9 carbon atoms or lower alkenyl of from 2 to 5 carbon atoms; R^2 is lower alkyl of from 1 to 9 carbon atoms, cycloalkyl of from 4 to 6 nuclear carbon atoms or phenyl or R^1 or R^2, taken together with the carbon atoms to which they are attached, form a cycloalkyl or cycloalkoxy alkyl of from 5 to 11 nuclear carbon atoms; R^3 is hydrogen, lower alkyl of from 1 to 5 carbon atoms, hydroxy ethyl or lower alkoxy carbonyl of from 2 to 6 carbon atoms; X is lower alkyl of from 1 to 5 carbon atoms, lower alkoxy of from 1 to 5 carbon atoms, lower alkoxycarbonyl lower alkyl or cyano; m is an integer of 0 to 2, and n and n' are integers having a value of 1 to 2, and the dotted line indicates provision for a carbon to carbon double bond with the proviso that when there is a carbon to nitrogen double bond R^1 and R^2, taken together with the carbon atom to which they are attached, is other than cyclopentyl.

4,507,292
COMBATING PESTS WITH ARYL N-OXALYL-N-METHYL-CARBAMATES

Gerhard Heywang; Engelbert Kühle, both of Bergisch-Gladbach; Wolfgang Behrenz, Overath; Ingeborg Hammann, Muelheim, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

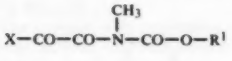
Filed Jan. 27, 1983, Ser. No. 461,368

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205195

Int. Cl.[3] **A01N** *43/84;* **C07D** *295/14*

U.S. Cl. 514—183 **7 Claims**

1. An aryl N-oxalyl-N-methylcarbamate of the formula



in which

R^1 represents a phenyl, naphthyl, benzodioxolanyl, dihydrobenzofuranyl or indanyl radical, the latter three radicals being attached via the aromatic ring thereof, the foregoing optionally being substituted by loweralkyl, loweralkenyl, loweralkinyl, loweralkoxy, loweralkenoxy, loweralkinoxy, loweralkylthio, loweralkenylthio, loweralkinylthio, diloweralkylamino, halogenoloweralkyl, halogen, nitro, cyano, cycloloweralkyl, dioxanyl and/or dioxolanyl, and

X represents a radical of the formula

wherein

R^3 and R^4 are identical or different and represent a hydrogen atom or a C_1 to C_6 alkyl, C_3 to C_6 alkenyl, C_3 to C_6 alkinyl, C_3 to C_6 cycloalkyl or C_4 to C_6 cycloalkenyl radical, each of which is optionally substituted by halogen, cyano, nitro, amino, hydroxyl, loweralkoxy or diloweralkylamino, or represent a phenyl radical which is optionally substituted by C_1 to C_4 alkyl, halogen, CN, NO_2, C_1 to C_4 alkoxy or C_1 to C_4 dialkylamino, or R^3 and R^4, together with the nitrogen atom to which they are bonded, can also form a ring, R^3 and R^4 then representing $-(CH_2)_n-$ with n=2 to 6, or representing $-CH_2-CH_2-Y-CH_2-CH_2-$,

wherein

Y represents oxygen, sulphur, sulphoxide or sulphone, or nitrogen.

7. A method of combating arthropods or nematodes comrising applying to the arthropods or nematodes, or to a habitat thereof, an arthropodicidally or nematocidally effective amount of a compound according to claim **1**.

4,507,293
ANTIMICROBIAL CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, and Kiyoshi Tsuji, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

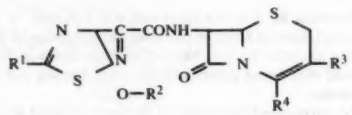
Division of Ser. No. 190,970, Sep. 26, 1980, Pat. No. 4,409,217. This application Jun. 15, 1983, Ser. No. 504,428

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[3] **C07D** *501/20*

U.S. Cl. 516—226 **8 Claims**

1. A syn isomer of a compound of the formula:



wherein

R^1 is amino or protected amino,

R^2 is carboxy(lower)alkyl or protected carboxyl(lower)alkyl,

R^3 is lower alkoxy, and

R^4 is carboxy or protected carboxy,

and a pharmaceutically acceptable salt thereof.

8. A pharmaceutical composition comprising an antimicrobially effective amount of a compound of claim **1** or pharmaceutically acceptable salt thereof in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,507,294
IMIDAZO[1,2-a]PYRAZINES

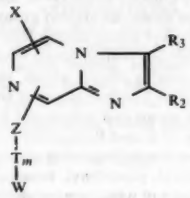
James A. Bristol, Ann Arbor, Mich., and Raymond G. Lovey, West Caldwell, N.J., assignors to Schering Corp., Kenilworth, N.J.

Filed Mar. 8, 1982, Ser. No. 356,052

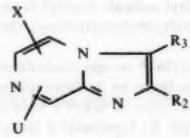
Int. Cl.[3] **C07D** *413/04;* **A61K** *270/00*

U.S. Cl. 514—249 **25 Claims**

1. A compound represented by the formulas:



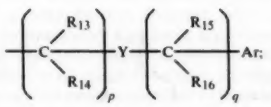
I



II

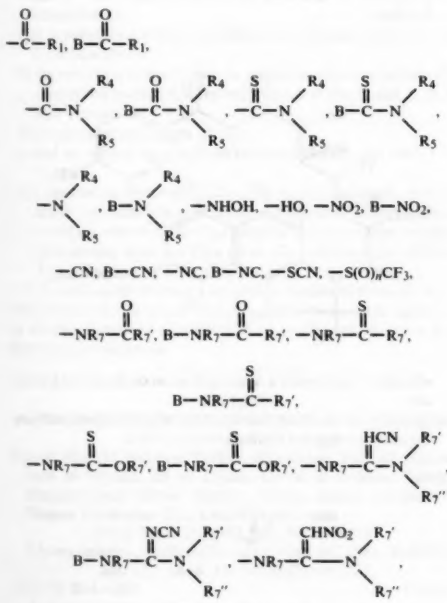
the 5,6,7,8-tetrahydro, 2,3-dihydro and perhydro derivatives thereof, and the pharmaceutically acceptable salts thereof, wherein:

U represents



R_2 and R_3 each independently represent hydrogen, lower alkyl, trifluoromethyl, B—CF_3, Ar, B—Ar, halogen, B—halogen —OR_7, B—OR_8, B—SR_6, —$S(O)_n$—R_7, $S(O)_n$— lower alkyl,

(wherein n is zero, one or two),



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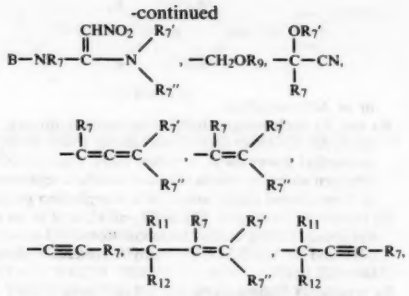
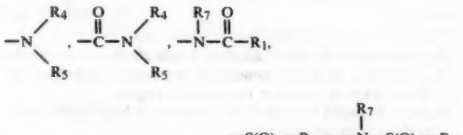


or a straight- or branched-chain alkenyl or alkynyl group having 2 to 6 carbon atoms and aryl-substituted derivatives thereof, or taken together are a cyclic alkyl of 3 to 6 bridging carbon atoms;

X represents hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, trifluoromethyl, —NO_2, —CN,



wherein n is zero, one or two with the proviso that when R_1 represents

n represents two;

Z represents —O—, —S—, —SO—, —SO_2—, —NR_6—, or a bond connecting T to the 5-, 6- or 8-position of the imidazo [1,2-a]pyrazine nucleus;

B represents a straight- or branched-chain lower alkylene moiety;

T represents a straight- or branched-chain lower alkylene moiety and; (a) when Z is a bond connecting T and the imidazo[1,2-a]pyrazine nucleus, T represents the —OR_7 derivatives of said imidazo[1,2-a]pyrazine, or the $\alpha(\beta)$- or $\beta(\gamma)$-unsaturated derivatives of said imidazo[1,2-a]pyrazine, or (b) when Z is —O—, T also represents the allylene derivatives of said imidazo[1,2-a]pyrazine;

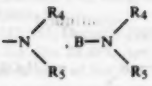
m is zero to 10 with the proviso that when W is Ar, m is not zero and the number of bridging carbons between Z and W is no greater than 5;

W represents hydrogen when T is allylene; or Ar, wherein Ar represents phenyl, 2-, 3- or 4- pyridyl, 2- or 3-thienyl, 2- or 4- imidazolyl, 2-, 3-, 4- or 5- furanyl or X'-, Y'- and Z'- substituted phenyl wherein each of X', Y' and Z' independently is as hereinabove defined for X; and when m is 1 to 3, W represents alkenyl, alkynyl, Z^1R_6 or Z^1COR_6 wherein Z^1 is O, S, SO, SO_2 or NR_6;

Y represents —O—, —S—, —SO—, —SO_2— or —NR_6—;

where in the above definitions:

R_1 represents Ar, lower alkyl,



or or Ar-loweralkyl;

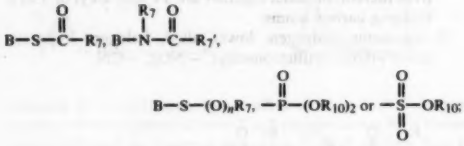
R_4 and R_5 each independently represents hydrogen, lower alkyl, Ar, Ar-lower alkyl, lower alkoxy lower alkyl, trifluoromethyl lower alkyl, or when taken together with the nitrogen atoms to which they are attached represents a 4- to 7-membered cyclic amino or a morpholino group;

R_6 represents hydrogen, C_1- to C_{12}-alkyl, aryl or an arylalkyl group having up to 12 carbon atoms:

R_7, R_7' and R_7'' each independently represents hydrogen or loweralkyl;

R_8 represents hydrogen, lower alkyl, lower alkoxy lower alkyl, trifluoromethyl lower alkyl, Ar-lower alkyl, or Ar;

R_9 represents



R_{10} represents M, alkali metal or lower alkyl;

R_{11} and R_{12} each independently represents hydrogen or lower alkyl or together represents oxygen;

R_{13} and R_{14} each independently represents hydrogen, alkyl, aryl, or together represents Y;

R_{15} and R_{16} each independently represents hydrogen, alkyl, aryl, or together represent —O— or —S—, provided that when R_{13} and R_{14} together represent —O— or —S—, R_{15} and R_{16} do not represent —O— or —S—;

p and q are each independently 0, 1 or 2 provided that when one of p and q is zero, the other is not zero.

4,507,295

PREPARATION OF AZINOMETHYL-RIFAMYCINS

Giovanni Franceschi, Milan, and Sergio Vioglio, Cusano Milanino, both of Italy, assignors to Farmitalia Carlo Erba S.P.A., Milan, Italy

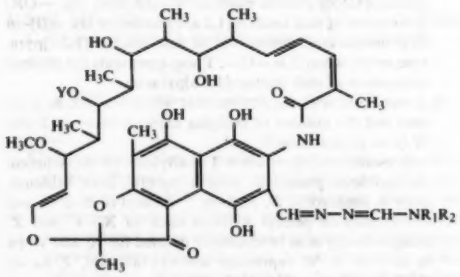
Filed Mar. 19, 1984, Ser. No. 590,649

Claims priority, application United Kingdom, Mar. 24, 1983, 8308166

Int. Cl.[3] **C07D** *498/08, 521/00*

U.S. Cl. 260—239.3 P **6 Claims**

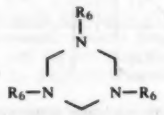
1. A method for the preparation of an azinomethyl-rifamycin having the formula



wherein Y represents a hydrogen atom or an acetyl group and either R_1 represents or branched alkyl group having from 1 to 7 carbon atoms or an alkenyl group having 3 or 4 carbon atoms and R_2 represents a linear or branched alkyl group having from 1 to 7 carbon atoms, a chloro-, hydroxy- or alkoxy-alkyl having from 2 to 4 carbon atoms, an alkenyl group having 3 or 4 carbon atoms, a cycloalkyl group having from 3 to 7 carbon atoms in the ring, a cycloalkyl-alkyl group having from 3 to 6 carbon atoms in the ring, a phenyl group, an unsubstituted aralkyl group having 7 or 8 carbon atoms or an aralkyl group having 7 or 8 carbon atoms and substituted by one halogen atom in the aryl group, or R_1 and R_2 together with the nitrogen atom to which they are bonded represent a cyclic moiety, said moiety being pyrrolidinyl, piperidinyl, hexahydroazepinyl or heptahydroazocinyl, each of which are unsubstituted or substituted with 1 or 2 methyl radicals, 4-alkyl-1- piperazinyl, morpholinyl or 1,2,3,4-tetrahydroisoquinolinyl, the method comprising

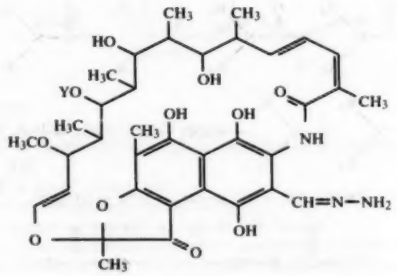
(a) dissolving rifamycin S in tetrahydrofuran, chloroform, dioxan, dichloromethane or dichloroethane,

(b) adding to the solution a Schiff's base of the formula $CH_2{=}NR_3$ wherein R_3 represents a tertiary lower alkyl group, or a compound of the formula $R_4H(CH_2OR_5)_2$ wherein R_4 represents lower alkyl or lower alkenyl group, a cycloalkyl group having 5 or 6 carbon atoms in the ring, or a phenyl, benzyl or α- or β-phenethyl group, and R_5 represents a hydrogen atom or a lower alkyl group, or a compound of the formula



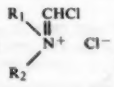
wherein R_6 represents an alkyl group having up to 6 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms in the ring, or an alkenyl group,

(c) adding hydrazine to form an intermediate compound which is a 3-hydrazonomethyl rifamycin SV having the formula



wherein Y represents a hydrogen atom or an acetyl group, and

(d) adding to the reaction medium a chloroformiminium chloride having the formula



wherein R_1 and R_2 are as above defined.

4,507,296
TETRAZOLES, PHARMACEUTICAL USE AND COMPOSITIONS

Roger Hayes; David E. Bays; John W. M. Mackinnon, and Linda Carey, all of Hertfordshire, England, assignors to Glaxo Group Limited, London, England

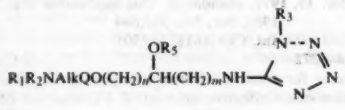
Continuation of Ser. No. 401,396, Jul. 23, 1982,. This application Jan. 9, 1984, Ser. No. 569,152

Claims priority, application United Kingdom, Feb. 16, 1982, 8204483

Int. Cl.[3] **A61K** *31/41;* **C07D** *257/06, 257/04*

U.S. Cl. 514—212 **7 Claims**

1. A compound of formula (I)



(I)

or a physiologically acceptable salt or hydrate thereof, in which

R_1 represents hydrogen, C_{1-14} alkyl, C_{3-8} cycloalkyl, C_{3-6} alkenyl, C_{3-6} alkynyl, ar C_{1-6} alkyl wherein the aryl group is phenyl or phenyl substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; trifluoro C_{1-6} alkyl, heteroaralkyl, wherein the heteroaryl group is thienyl, pyrrolyl, pyridyl, furyl or thiazolyl, which is unsubstituted or substituted by C_{1-3} alkyl, C_{1-3} alkoxy, hydroxy C_{1-6} alkyl, amino C_{1-6} alkyl, C_{1-6} alkylamino C_{1-6} alkyl, di C_{1-6} alkylamino C_{1-6} alkyl or halogen, the alkyl portion of the heteroaralkyl group is a straight or branched C_{1-4} alkyl chain, and the heteroaryl ring is linked to the alkyl portion through a carbon atom; or C_{1-6} alkyl substituted by C_{3-8} cycloalkyl, hydroxy, C_{1-6} alkoxy, amino, C_{1-6} alkylamino or di C_{1-6} alkylamino; and

R_2 represents hydrogen or a C_{1-4} alkyl group;

or R_1 and R_2 together with the nitrogen atom to which they are attached form piperidino, morpholino, 4-methyl piperidino, pyrrolidino, hexamethyleneimino or tetrahydropyridino;

Alk represents a straight or branched alkylene chain of 1 to 3 carbon atoms;

Q represents a benzene ring in which incorporation into the rest of the molecule is through bonds at the 1- and 3- or 1- and 4-positions;

R_5 represents hydrogen or acyl;

n and m, which may be the same or different, are each 1 or 2; and

R_3 represents hydrogen, C_{1-6} alkyl, C_{3-6} alkenyl, ar C_{1-6} alkyl, wherein the aryl group is phenyl or phenyl substituted by one or more C_{1-3} alkyl or alkoxy groups or halogen atoms; hydroxy C_{2-6} alkyl, C_{1-6} alkoxy C_{2-6} alkyl or C_{1-4} alkanoyloxy C_{2-6} alkyl.

7. A method of treating a condition mediated through histamine H_2-receptors which comprises administering to a patient an effective amount of a compound as claimed in claim 1 to relieve said condition.

4,507,297
PIPERAZINE DERIVATIVES AND A MEDICINE CONTAINING THE SAME

Tomoh Masaki, Sakura; Toshiro Kamishiro; Takashi Okazoe, both of Misato, all of Japan; Koichi Kumakura, London, England, and Mitsuo Masaki, Chiba, Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

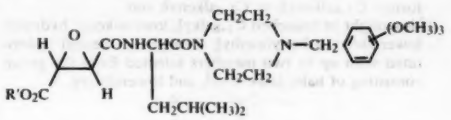
Filed Mar. 25, 1982, Ser. No. 361,506

Claims priority, application Japan, Apr. 10, 1981, 56-53116

Int. Cl.[3] **A61K** *31/495;* **C07D** *405/12*

U.S. Cl. 514—252 **9 Claims**

1. A compound of the formula (1),



wherein R' is hydrogen or a straight or branched chain C_1–C_4 alkyl group.

4,507,298
6-{4-(ω-(1-IMIDAZOLYL)-ALKYL-PHENYL}-3-OXO-2,3,4,5-TETRAHYDRO-PYRIDAZINES AND ACID ADDITION SALTS THEREOF, AND A PROCESS FOR THE TREATMENT OF INFLAMMATORY, ATHEROSCLEROTIC AND THROMBOEMBOLIC ILLNESSES IN HUMANS

Hans-Heiner Lautenschläger, Pulheim-Stommeln; Gerd Hilboll, Cologne; Hugo Friehe, Erftstadt-Lechenich, and Josef P. Löhr, Hilden, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

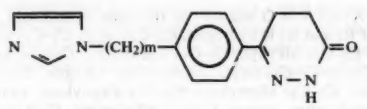
Filed Jul. 12, 1982, Ser. No. 397,091

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130251

Int. Cl.[3] **C07D** *403/10;* **A61K** *31/415, 31/50*

U.S. Cl. 514—247 **13 Claims**

1. 6-{4-[ω-(1-Imidazolyl)-alkyl]-phenyl}-3-oxo-2,3,4,5-tetrahydro-pyridazines of the formula I



I

in which m denotes an integer from 1 to 12, and acid addition salts thereof with inorganic or organic acids.

4,507,299
N-[2-AMINO-5-HALO-6-(SUBSTITUTED)-3-PYRAZINYL)-METHYLENE]AMINE ANTIMICROBIAL COMPOUNDS

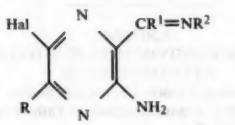
David B. R. Johnston, Warren, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 27, 1982, Ser. No. 453,055

Int. Cl.[3] **C07D** *241/16;* **A01N** *43/60*

U.S. Cl. 514—255 **14 Claims**

1. A compound of the formula:



(I.)

wherein:

Hal is bromine or chlorine;

R is halo; mono- or di-substituted mono- or diloweralkylamino wherein the loweralkyl substituents are hydroxy or loweralkanoyloxy; mercapto; straight or branched chain C_{1-8}alkylthio; mono- or di-substituted loweralkylthio wherein the substituents are hydroxy, amino, loweralkanoylamino, or loweralkoxycarbonyl; phenylthio; loweralkylsulfoxy; or loweralkylsulfonyl;

R^1 is hydrogen; straight or branched C_{1-8}alkyl; phenyl; phenyl substituted with up to two members selected from the group consisting of C_{1-3}alkyl, C_{1-3}alkoxy, halo, and

mono- or di-C_{1-3}alkyl substituted amino; heterophenyl formyl C_{2-4}alkenyl; or C_{2-4}alkenyl; and

R^2 is straight or branched C_{1-8}alkyl; loweralkoxy; hydroxy; loweralkoxycarbonylmethyl; benzyl; or benzyl substituted with up to two members selected from the group consisting of halo, loweralkyl, and loweralkoxy.

4,507,300
PYRIDOTRIAZOLOPYRAZINE-DIONES FOR TREATING ALLERGY

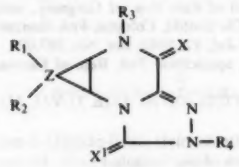
Richard E. Brown, East Hanover, N.J.; Vassil St. Georgiev, New Rochelle, N.Y.; Philip Kropp, Meriden, Conn., and Bernard Loev, Scarsdale, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Division of Ser. No. 244,361, Mar. 16, 1981, Pat. No. 4,400,382, which is a continuation-in-part of Ser. No. 148,314, May 9, 1980, abandoned. This application Jun. 6, 1983, Ser. No. 553,915

Int. Cl.[3] **A61K** *31/495*; **C07D** *487/14, 471/14, 487/04*

U.S. Cl. 514—280 **5 Claims**

1. An anti-allergic compound of the formula:



wherein,

X and X^1 are S or O and may be the same or different;

each of R_1 and R_2 is hydrogen, C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl, C_3–C_{10} cycloalkyl, C_6–C_{10} aryl, C_6–C_{10}-ar-C_1–C_{10}-alkyl, sulfonamido, halogen, C_1–C_{10} alkoxy, C_2–C_{10} alkenyloxy, C_2–C_{10} alkynyloxy, cyano, hydroxy, nitro, amino, C_1–C_{10} alkylamino, C_1–C_{10} alkanoylamino, carb-C_1-C_{10}-alkoxyamino, methanesulfonyl, carboxy, carb-C_1-C_{10}-alkoxy, trihalomethyl, or taken together, methylenedioxy;

each of R_3 and R_4 is hydrogen, C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl, C_6–C_{10} aryl, C_1–C_{10} alkanoyl, benzoyl, C_6–C_{10}-ar-C_1-C_{10}-alkyl, C_3–C_{10} cycloalkyl, C_3–C_{10}-cycloalkyl CH_2—, or carb-C_1–C_{10}-alkoxy; and

Z forms a pyridyl ring with the two carbon atoms to which it is attached; and

pharmaceutically acceptable acid additon salts thereof, and where R_4 is hydrogen, the pharmaceutically acceptable alkali and alkaline-earth metal salts thereof.

5. A pharmaceutical composition containing a compound according to claim 1 in an amount effective as an antiallergic agent and a pharmaceutically acceptable carrier.

4,507,301
ANTI-CANCER COMPOSITION FOR DELIVERING 5-FLUOROURACIL

Setsuro Fujii, Toyonaka; Norio Unemi, and Setsuo Takeda, both of Tokushima, all of Japan, assignors to Taibo Pharmaceutical Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 15,161, Feb. 26, 1979, , which is a continuation-in-part of Ser. No. 891,343, Mar. 29, 1977, abandoned. This application Dec. 8, 1980, Ser. No. 214,022

Claims priority, application Japan, Apr. 5, 1977, 52-39341; Feb. 10, 1978, 53-14676

The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.

Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 514—274 **9 Claims**

9. A method of delivering 5-fluorouracil to a cancer sensitive to 5-fluorouracil in a warm-blooded animal, the method comprising administering to said animal in separate doses uracil or a pharmaceutically acceptable salt thereof and 1-(2-tetrahydrofuryl)-5-fluorouracil wherein about 0.01 to less than 0.1 mole of 1-(2-tetrahydrofuryl)-5-fluorouracil is used per mole of the uracil or salt thereof, in an amount which is effective to deliver an anti-cancer amount of 5-fluorouracil to the cancer.

4,507,302
METHOD FOR TREATING ARTHRITIS WITH 6-ARYL PYRIMIDINE COMPOUNDS

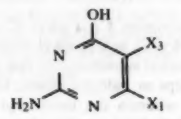
Patricia E. Fast, and Wendell Wierenga, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 255,159, Jan. 15, 1981, abandoned, which is a continuation of Ser. No. 79,850, Sep. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 22,025, Mar. 19, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 303,694

Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 514—272 **3 Claims**

1. A process for treating arthritis comprising the systemic administration of an effective amount of a compound of the formula:

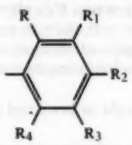


wherein X_3 is equal to X_4 or X_5 wherein X_4 is fluoro, chloro, bromo or iodo, and X_5 is mono-, or trihalo methyl; mono-, di- or trifluoroethyl, perfluoropropyl, and

wherein X_1 is a member selected from the group consisting of:

(a) phenyl,

(b) a monosubstituted phenyl of the formula:



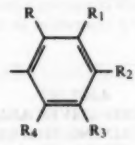
wherein provided that only one of groups R, R_1, R_2, R_3 and R_4 is other than hydrogen, and

R or R_4 is alkyl of from 1 to 8 carbon atoms, inclusive, isomeric forms, alkoxy of from 1 to 8 carbon atoms, fluoro, chloro, bromo, iodo, or nitro;

R_1 or R_3 is fluoro, chloro, bromo, iodo, nitro, trifluoromethyl, or alkoxy of from 1 to 8 carbon atoms, and

R_2 is chloro, fluoro, bromo, iodo, or alkyl of from 1 to 5 carbon atoms, inclusive,

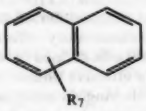
(c) a disubstituted phenyl of the formula



wherein any two of R, R_1, R_3 and R_4 are not hydrogen and are the same or different and are fluoro, chloro, bromo, iodo, alkyl of from 1 to 8 carbon atoms, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive isomeric forms, nitro and trifluoromethyl;

(d) a trihalo substituted phenyl wherein halo is chloro, bromo, iodo or fluoro;

(e) α-naphthyl of the formula



wherein R_7 is substituted in either ring and is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive, including isomeric forms, fluoro, chloro, iodo, bromo or nitro;

(f) 3-pyridyl,

(g) 2-pyridyl, and

with the overall proviso that when X_3 is iodo then X_1 may not be a monosubstituted phenyl wherein R or R_1 is methoxy, R_1 is iodo or R is chloro;

when X_3 is bromo the X_1 may not be disubstituted phenyl wherein R_1 and R_3 are methoxy or a monosubstituted phenyl wherein R_2 is isopropyl,

R_1 is iodo or R or R_1 is chloro;

when X_3 is chloro then X_1 may not be a monosubstituted phenyl wherein R_1 is methoxy, or

a salt of the compound in association with a pharmaceutical carrier to a human or animal with arthritis.

4,507,303

SUCCINIMIDE DERIVATIVES, COMPOSITIONS AND METHOD OF USE

Kikuo Ishizumi, Toyonaka; Fujio Antoku, and Yukio Asami, both of Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

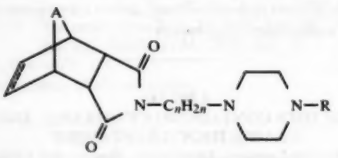
Filed Dec. 1, 1982, Ser. No. 446,047

Claims priority, application Japan, Dec. 22, 1981, 56-208379; Jun. 3, 1982, 57-95763

Int. Cl.[3] **A61K** *31/505;* **C07D** *403/04, 403/14*

U.S. Cl. 514—255 **9 Claims**

1. A succinimide derivative of the formula:



wherein A is an oxygen atom, a methylene group or an ethylene group and a full line accompanying a broken line (⟊) is a single bond or a double bond, R is a phenyl group, optionally substituted with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy or trifluoromethyl, a 2-pyridyl group or a 2-pyrimidinyl group and n is an integer of 3 or 4, or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition which comprises as an active ingredient a pharmaceutically effective amount of at least one of the compounds claimed in claim 1 and at least one pharmaceutically acceptable inert carrier or diluent.

4,507,304

USE OF 6-AMINO-5-PYRIMIDINECARBONITRILE DERIVATIVES AS CARDIOTONIC AGENTS

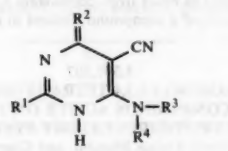
Jehan F. Bagli, Kirkland, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,887

Int. Cl.[3] **A61K** *31/505*

U.S. Cl. 514—269 **6 Claims**

1. A method of increasing cardiac contractility in a mammal, which comprises administering to the mammal in need thereof an effective cardiotonic amount of a compound of the formula



in which R^1 is lower alkyl, cyclo(lower)alkyl or benzyl; R^2 is oxo or thioxo; R^3 is hydrogen or lower alkyl; and R^4 is lower alkyl; or a therapeutically acceptable addition salt thereof.

4,507,305

9-(1,3-DIHYDROXY-2-PROPOXYMETHYL)GUANINE AS ANTIVIRAL AGENT

Julien P. H. Verheyden, Los Altos, and John C. Martin, Redwood City, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 380,969, May 24, 1982, Pat. No. 4,423,050, which is a continuation-in-part of Ser. No. 267,210, May 21, 1981, Pat. No. 4,355,032. This application Apr. 13, 1983, Ser. No. 473,169

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.[3] **C07D** *473/18;* **A61K** *31/52*

U.S. Cl. 514—262 **20 Claims**

1. An injectable pharmaceutical composition useful for treating viral infections in a mammal having a viral infection comprising an effective amount of the compound 9-(1,3-dihydroxy-2-propoxymethyl)guanine or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier.

4,507,306

CIS-4A-ARYL-1,2,3,4,4A,9B-HEXAHYDRO-BENZOFURO[3,2-C]PYRIDINES AND THEIR ANTI-CONVULSANT AND ANALGESIC ACTIVITY

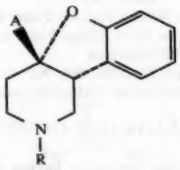
Solomon S. Klioze, Flemington, N.J., assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jul. 22, 1982, Ser. No. 400,576

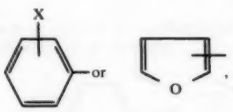
Int. Cl.[3] **C07D** *491/14;* **A61K** *31/445*

U.S. Cl. 514—291 **52 Claims**

1. A compound of the formula



wherein A is



X being hydrogen, halogen, methyl, methoxy or hydroxyl, halogen being fluorine, chlorine, bromine or iodine; and R is hydrogen, loweralkyl, loweralkenyl, phenylloweralkyl, or cycloalkylloweralkyl, where the phenyl group in said phenylloweralkyl group may have a halogen attached thereto and a

pharmaceutically acceptable acid addition salt of any of the foregoing.

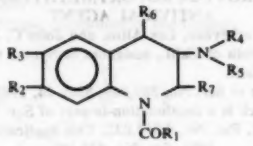
52. A method of treatment which comprises administering to a patient in need of relief from convulsion a pharmaceutically effective amount of a compound defined in claim 1.

4,507,307
N_1-ACYL-3-AMINO-1,2,3,4-TETRAHYDROQUINOLINE COMPOUNDS ACTIVE ON THE CARDIOCIRCULATORY SYSTEM

Vittorio Vecchietti; Emilio Mussini, and Giorgio Ferrari, all of Milan, Italy, assignors to Simes, Milan, Italy

Filed Jul. 28, 1982, Ser. No. 402,551
Claims priority, application Italy, Jul. 29, 1981, 23213 A/81
Int. Cl.³ A61K *31/47*; C07D *215/38*
U.S. Cl. 514—313 14 Claims

1. A compound of the formula



wherein

R_1 is selected from the group consisting of a straight or branched chain alkyl having from 1 to 20 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, phenyl, phenyl substituted by a halogen atom, phenyl alkyl (1–4 C), cinnamoyl, pyridinyl, and pyridinyl substituted by one or two halogen atoms;

R_2 and R_3 are the same or different and each is selected from the group consisting of a hydrogen atom, hydroxy and alkoxy having from 1 to 6 carbon atoms, provided that at least one of R_2 and R_3 is different from hydrogen; and

R_4, R_5, R_6 and R_7 are the same or different and each is selected from the group consisting of a hydrogen atom and alkyl having from 1 to 6 carbon atoms;

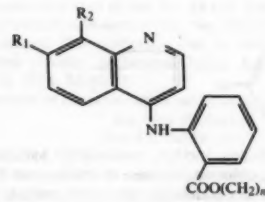
or a pharmaceutically acceptable acid addition salt thereof, said compound being useful in the therapy of affections of the cardiocirculatory system.

4,507,308
ANALGESICALLY OR ANTI-INFLAMMATORY EFFECTIVE 4-QUINOLYL ANTHRANILIC ACID DERIVATIVES

Dante Nardi; Gianni Motta; Rodolfo Testa; Gabriele Graziani, and Silvano Casadio, all of Milan, Italy, assignors to Recordati S.A., Chiasso, Switzerland

Filed Sep. 28, 1982, Ser. No. 426,229
Claims priority, application United Kingdom, Sep. 30, 1981, 8129473
Int. Cl.³ A61K *31/47*; C07D *215/44*
U.S. Cl. 514—313 10 Claims

1. An anthranilic acid derivative having the structural formula (I):



(I)

wherein n is 0, 1 or 2, one of R_1 and R_2 is chloro or trifluoromethyl and the other is hydrogen, and R is 2-oxo-3-oxolanyl or 2-oxo-3-oxazolidinyl.

8. A pharmaceutical composition of matter comprising an analgesically or anti-inflammatory effective amount of the anthranilic acid derivative as defined by any of claims 1 to 7, and a pharmaceutically effective diluent or carrier therefor.

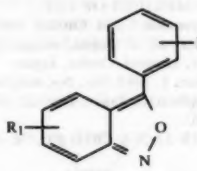
9. The method for eliciting an analgesic or anti-inflammatory response in a warm-blooded animal, comprising administering to a warm-blooded animal in need of such treatment, an analgesically or anti-inflammatory effective amount of the anthranilic acid derivative as defined by any of claims 1 to 7.

4,507,309
PHARMACEUTICAL COMPOSITION FOR TREATING TRANSPLANTED TUMOR CELLS

Shin-ichi Kaiho, Chiba; Koji Mizuno, Saitama; Shun-ichi Hata, Kanagawa; Masuo Koizumi, Tokyo; Masamitsu Honda, Tokyo; Yasushi Murakami, Tokyo; Shigeru Takanashi, Saitama, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,354
Claims priority, application Japan, Apr. 21, 1981, 56-59153
Int. Cl.³ A61K *31/42*
U.S. Cl. 514—379 5 Claims

1. A pharmaceutical composition in the form of a tablet, capsule or suppository comprising 10–70% by weight of an anthranyl derivative of the formula



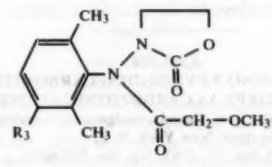
wherein R_1 and R_2 may be the same or different and represent hydrogen, hydroxyl, lower alkoxy, lower alkyl, nitro or halogen; and a pharmaceutical carrier.

4,507,310
FUNGICIDES CONTAINING CYMOXANIL AND AN OXAZOLIDENYLACETAMIDE

André Devoise-Lambert, Tagolsheim, France, and Ulrich Gisi, Wenslingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 21, 1983, Ser. No. 459,761
Claims priority, application United Kingdom, Jan. 26, 1982, 8202125; Oct. 29, 1982, 8231012
Int. Cl.³ A01N *37/34*, *43/76*, *57/00*
U.S. Cl. 514—376 10 Claims

1. A fungicidal composition comprising a component (a) of the formula I,



I

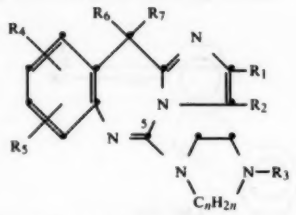
wherein R_3 is hydrogen, chloro or bromo, and a component (b) which is CYMOXANIL; the weight ratio of component (a) to component (b) being in the range of from 10:1 to 1:3.

4,507,311
IMIDAZO[1,2-c][1,3]BENZODIAZEPINES

Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 444,957, Nov. 29, 1982, Pat. No. 4,460,587, which is a continuation-in-part of Ser. No. 328,274, Dec. 7, 1981, abandoned. This application Apr. 23, 1984, Ser. No. 602,649
Int. Cl.³ A61K *31/415;* C07D *487/04*
U.S. Cl. 260—239 BD 2 Claims

1. A compound of the formula



(I)

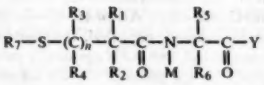
wherein each of R_1 and R_2 are hydrogen, lower alkyl, cyano, carboxy, lower alkoxycarbonyl or carbamoyl; n represents the integer 3; R_3 is hydrogen, lower alkyl, lower alkoxycarbonyl or hydroxy lower alkyl of 2 to 4 carbon atoms; R_4 represents hydrogen, lower alkyl, lower alkoxy, lower alkylthio, halogen or trifluoromethyl; R_5 represents hydrogen; and R_6 and R_7 represent hydrogen or lower alkyl; and N-oxide; or a pharmaceutically acceptable salt thereof.

4,507,312
ANTIHYPERTENSIVE AMIDES

John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; Bruce E. Williams, Cottage Grove, Minn., and Alfred Schwab, Williston Park, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Division of Ser. No. 200,180, Oct. 24, 1980, Pat. No. 4,304,771, Continuation-in-part of Ser. No. 57,175, Jul. 13, 1979, Pat. No. 4,256,761. This application Nov. 23, 1981, Ser. No. 323,852
Int. Cl.³ A61K *31/34;* C07D *307/06*
U.S. Cl. 514—471 11 Claims

1. Compounds of the structure:

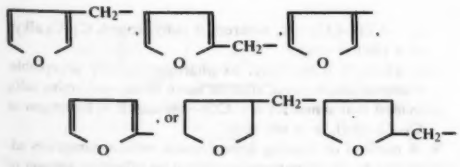


wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are independently hydrogen, alkyl, alkenyl containing 2 to 6 carbon atoms, alkynyl containing 2 to 6 carbon atoms, phenyl-alkyl, or cycloalkyl containing 3 to 16 carbon atoms,

n is an integer from 0 to 4 inclusive,

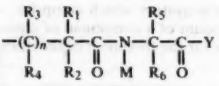
M is heterocyclic or heterocyclic alkyl and is selected from the group consisting of



Y is hydroxy, alkoxy, amino, aminoalkanoyl, hydrocarbylaryloxy containing from 6 to 10 carbon atoms, aminoalkoxy, or hydroxyalkoxy, and

R_7 is hydrogen, alkanoyl, carboxylalkanoyl, hydroxyalkanoyl, amino-alkanoyl, cyano, amidino, carbalkoxy, ZS, or

wherein Z is hydrogen, alkyl, hydroxyalkyl, aminoalkyl or the radical



wherein R_1, R_2, R_3, R_4, R_5, R_6, n, M and Y are as described above; and where Y is hydroxy their nontoxic, pharmaceutically acceptable alkali metal, alkaline earth metal, and amine salts,

wherein the alkyl groups per se and alkyl moieties of groups containing an alkyl group, contain 1 to 6 carbon atoms.

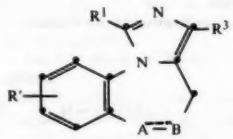
2. A method of reducing the blood pressure in mammals having hypertension which comprises administering to said animals an effective amount of a compound according to claim 1.

4,507,313
OXADIAZOLYL-IMIDAZO-[1,4]BENZODIAZEPINES AND THEIR USE IN TREATMENT OF DISEASES OF THE CENTRAL NERVOUS SYSTEM

Claus T. Braestrup, Roskilde; Joergen A. Christensen, Virum; Mogens Engelstoft, Vaerloese, and Frank Waetjen, Bagsvord, all of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Filed Nov. 15, 1983, Ser. No. 551,818
Claims priority, application Denmark, Nov. 15, 1982, 5102/82
Int. Cl.³ A61K *31/555;* C07D *521/000*
U.S. Cl. 514—220 16 Claims

1. An oxadiazolyl-imidazo-[1,4]benzodiazepine of the formula

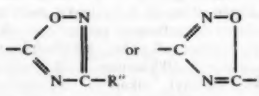


wherein,

R' is hydrogen or chlorine, fluorine or nitro in the 7- or 8-position,

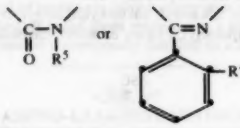
R^1 is hydrogen or alkyl of 1–3 carbon atoms,

R^3 is an oxadiazolyl of the formula



R'' is alkyl of 1–3 carbon atoms,

A=====B is



R^5 is hydrogen or methyl, and
R''' is hydrogen or chlorine.

16. A method of treating a patient suffering from a disease of the central nervous system which comprises administering to the patient an amount of a compound of claim 1 effective as a therapeutic agent for the treatment of the disease of the central nervous system.

4,507,314

DRUG FOR TREATING AFFECTIONS PROVOKED BY A TOO HIGH HISTAMINE LEVEL, OF THE GASTRODUODENAL MUCOSA AND ALLERGIC AFFECTIONS

Paul J. Niebes, Grez-Doiceau; Daniel M. Matagne, Taviers; Etienne P. Hanon, Saint-Gilles; Joseph L. Roba, Dion-Valmont, and Georges E. Lambelin, Forest, all of Belgium, assignors to Midit, Societe Fiduciaire, Vaduz, Liechtenstein

Filed Jul. 20, 1983, Ser. No. 515,500
Int. Cl.³ A61L *9/04;* **A61K** *31/365, 31/195*
U.S. Cl. 514—456 **6 Claims**

1. A method for treating a disorder related to an undesirable high histamine level or to an undesirable high histamine release in the body, which comprises administering to a host in need of such treatment, an effective amount of the reaction product of (+)-catechin with L-lysine and with another acid selected from the group consisting of hydrochloric and ascorbic acid.

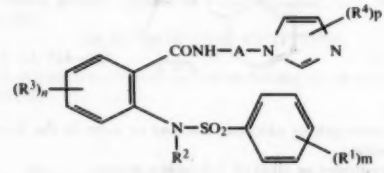
4,507,315

HYPOGLYCAEMIC AND HYPOLIPIDAEMIC BENZAMIDE SUBSTITUTED (1H-) IMIDAZOLE DERIVATIVES AND COMPOSITIONS

Michael J. Ashton, Chelmsford; David C. Cook, London; Colin J. Daniels, Romford; Anthony H. Loveless, Hornchurch; Jeremy D. Pratt, Romford, and Bernard T. Bull, Launceston, all of England, assignors to May & Baker Limited, Essex, England

Filed Aug. 22, 1983, Ser. No. 525,503
Claims priority, application United Kingdom, Aug. 24, 1982, 8224296
Int. Cl.³ A61J *31/415;* **C07D** *233/54*
U.S. Cl. 514—396 **14 Claims**

1. A benzamide derivative of the formula:



wherein A represents a divalent straight- or branched-chain alkylene group containing from 1 to 6 carbon atoms and R^1 represents a halogen atom or a hydroxy, mercapto, amino, nitro, cyano, carboxy or carbamoyl group or an alkyl, fluorine-substituted alkyl, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, alkoxycarbonyl, alkylamino, dialkylamino, alkylcarbamoyl, dialkylcarbamoyl, alkanoyl, alkanoyloxy or alkanoylamino group and m represents zero or the integer 1, 2 or 3, R^2 represents a hydrogen atom or an alkyl group, R^3 represents a halogen atom or a hydroxy, amino, nitro, cyano, carboxy or carbamoyl group or an alkyl, fluorine-substituted alkyl, alkoxy, alkoxycarbonyl, dialkylamino, alkylcarbamoyl or alkanoylamino group and n represents zero or the integer 1 or 2, R^4 represents an alkyl radical and p represents zero or the integer 1 or 2, alkyl groups, alkoxy groups and alkanoyl groups within the definitions of R^1, R^2, R^3 and R^4 being straight- or branched-chain and containing from 1 to 10 carbon atoms, or a pharmaceutically acceptable salt thereof.

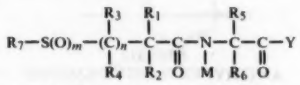
4,507,316

ANTIHYPERTENSIVE COMPOUNDS

Raymond D. Youssefyeh, Tarrytown, N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Jun. 1, 1981, Ser. No. 269,166
Int. Cl.³ A61K *31/27, 31/265;* **C07C** *155/02, 154/02*
U.S. Cl. 514—510 **9 Claims**

1. A compound of the formula



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, phenyl-C_1–C_6-alkyl, or C_3–C_{16} cycloalkyl, and may be the same or different;

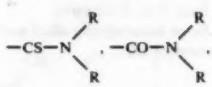
m is an integer from 0 to 2 inclusive;

n is an integer from 0 to 4 inclusive;

M is C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_{16} cycloalkyl, C_3–C_{16} cycloalkyl-C_1–C_6-alkyl, C_3–C_{16} polycycloalkyl, C_3–C_{16} polycycloalkyl-C_1–C_6-alkyl, C_1–C_6 alkylthio-C_1–C_6-alkyl, C_1–C_6-alkylamino-C_1–C_6-alkyl, di-C_1–C_6-alkylamino-C_1–C_6-alkyl, Ar, or Ar-C_1–C_6-alkyl, wherein Ar is phenyl, indanyl, naphthyl, tetrahydronaphthyl, or decahydronaphthyl, and Ar is optionally substituted with C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, hydroxy, mercapto, amino, C_1–C_6 alkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylamino, or halo;

Y is hydroxy, C_1–C_6-alkoxy, amino, amino-C_1–C_6-alkanoyl, amino-C_1–C_6-alkoxy, or hydroxy-C_1–C_6-alkoxy; and

R_7 is —CO—SR, —CS—SR,



or —CO—CO_2—R, wherein R is hydrogen, C_1–C_6 alkyl, or a phenyl ring;

and where Y is hydroxy, its pharmaceutically acceptable, nontoxic alkali metal, alkaline earth metal, and amine salts, provided that when R_7 is —CO—SR and R is hydrogen or C_1–C_6 alkyl, m is not zero.

9. A method of treating hypertension which comprises administering to the hypertensive animal an effective amount of a compound according to claim 1.

4,507,317

ACARICIDAL 2,2'-BRIDGED[1,1'-BIPHENYL]-3-YLMETHYL ESTERS

Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philidelphia, Pa.

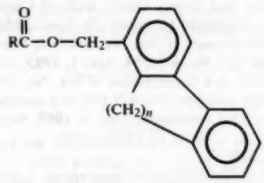
Continuation-in-part of Ser. No. 368,608, Apr. 15, 1982, Pat. No. 4,451,484, which is a division of Ser. No. 259,111, Apr. 30, 1981, abandoned. This application Apr. 13, 1984, Ser. No. 599,863

The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.

Int. Cl.[3] **C07C** *69/743;* **A01N** *53/00*

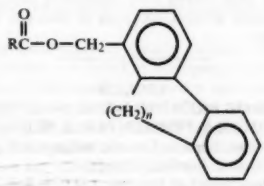
U.S. Cl. 514—531 **4 Claims**

1. An acaricidal compound of the formula



wherein n is 2–4 and R is 3-(2,2-difluoroethenyl)-2,2-dimethylcyclopropyl.

3. An acaricidal composition comprising in admixture with an agriculturally acceptable carrier an acaricidally effective amount of at least one compound of the formula



wherein n is 2 to 4 and R is selected from 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropyl; 3-(2,2-difluoroethenyl)-2,2-dimethylcyclopropyl; or 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropyl.

4,507,318

1-ARYL 2-AMINOMETHYL CYCLOPROPANE CARBOXYLATES (Z) AS DRUGS IN THE TREATMENT OF PAIN

Henri Cousse; Gilbert Mouzin; Bernard Bonnaud; Marie Charveron, all of Castres, and Francois Fauran, Castanet-Tolosan, all of France, assignors to Pierre Fabre S.A., Castres, France

Filed Jun. 22, 1982, Ser. No. 390,811

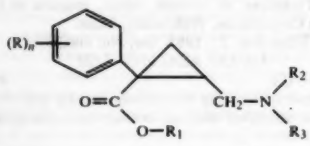
Claims priority, application France, Jun. 23, 1981, 81 12311

Int. Cl.[3] **A61K** *31/34, 31/215, 31/395;* **C07C** *93/24*

U.S. Cl. 514—531 **24 Claims**

1. A pharmaceutical composition, useful for alleviation of pain, characterized by the fact that as active principle it contains at least one compound selected from (A) a 1-aryl 2-aminomethyl cyclopropane carboxylate (Z) of formula I:

(I)



in which:

R represents halogen, C_1 to C_4 alkoxy, nitro, amino, sulfamoyl, or hydroxy;

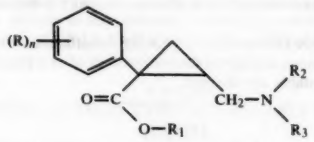
n represents the value 1, 2 or 3;

R_1 represents linear or branched C_1 to C_5 alkyl of alkenyl;

R_2 and R_3 independently represent hydrogen or a linear or branched C_1 to C_5 alkyl or alkenyl, and (B) a salt thereof with a therapeutically-acceptable inorganic or organic acid.

21. A method of alleviating pain comprising administering to a subject, suffering from pain, an effective pain-alleviating amount of a compound selected from (A) 1-aryl 2-aminomethyl cyclopropane carboxylates (Z) of formula I:

(I)



in which:

R represents hydrogen or halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, nitro, amino, sulfamoyl or hydroxy; n represents the values 1, 2 or 3; R_1 represents linear or branched C_1 to C_5 alkyl or alkenyl; R_2 and R_3 independently represent hydrogen, or linear or branched C_1 to C_5 alkyl or alkenyl, provided, however, that when R_1 represents the ethyl radical and R represents a hydrogen atom, R_2 and R_3 cannot simultaneously each represent a methyl radical, and (B) a salt thereof with a therapeutically-acceptable inorganic or organic acid, or a pharmaceutical composition containing the said compound together with a pharmaceutically-acceptable diluent or carrier.

4,507,319

SKIN TREATMENT COMPOSITION

Martin D. Barratt, Bedford; Paul A. Bowser, Wirral; James A. Durrant, Bebington; Dieno George; Keith J. Hall, both of Wirral; John C. Hill, South Wirral; Michael R. Lowry, Trafford, and Colin Prottey, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,641

Claims priority, application United Kingdom, Feb. 2, 1982, 8202886; Jul. 20, 1982, 8220981

Int. Cl.[3] **A61K** *31/20, 31/22*

U.S. Cl. 514—546 **17 Claims**

1. A cosmetically acceptable aqueous composition for topical application to human skin, which comprises:

(i) from 0.1 to 20% by weight of 2-hydroxyoctanoic acid;

(ii) from 0.1 to 50% by weight of ethyl lactate; and

(iii) an amount of an alkanolamine sufficient to adjust the pH of the composition to a value of from 3.8 to 4.5.

9. A method for the treatment of acne which comprises applying topically to acneic skin an effective amount of a cosmetically acceptable aqueous composition comprising:

(i) from 0.1 to 20% by weight of a substituted octanoic acid chosen from 2-hydroxyoctanoic acid, 2-ketooctanoic acid or a mixture thereof; and

(ii) an amount of neutralising agent sufficient to adjust the pH of the composition to a value of from 3 to 7, the neutralising agent having a cation whose ionic radius is at least 100 pm.

4,507,320
DOPAMINERGIC AGONIST N,N-DI-N-PROPYL-4-HYDROXY-3-METHANESULFONAMIDOPHENETHYLAMINE

Robert M. DeMarinis, Ardmore; J. Paul Hieble, Philadelphia, both of Pa.; Carl Kaiser, Haddon Heights, N.J., and James W. Wilson, Wayne, Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Filed Dec. 7, 1983, Ser. No. 559,151
Int. Cl.³ C07C *143/75*; A61K *31/18*
U.S. Cl. 514—605 **12 Claims**

1. A method for inducing DA_2-agonist activity in a subject in need thereof comprising administering internally to said subject a nontoxic, effective therefor quantity of N,N-di-n-propyl-4-hydroxy-3-methanesulfonamidophenethylamine, a prodrug derivative thereof or a pharmaceutically acceptable salt thereof.

9. N,N-Di-n-propyl-4-hydroxy-3-methanesulfonamidophenethylamine, a prodrug derivative thereof or a pharmaceutically acceptable salt thereof.

4,507,321
EPITHELIAL CELL GROWTH REGULATING COMPOSITION CONTAINING POLYAMINES AND A METHOD OF USING SAME

Ilene H. Raisfeld, Setauket, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Filed Feb. 17, 1982, Ser. No. 349,598
Int. Cl.³ A61K *31/13, 31/155*
U.S. Cl. 514—673 **14 Claims**

1. A method of stimulating epithelial cell regrowth in wound healing which comprises administering to a human or animal in need to same an effective amount of an epithelial cell regrowth stimulating agent selected from the group consisting of: aliphatic di- and polyamines with straight- or branched-chain length from 7 to 14 carbon atoms long bearing 2 to 6 amine groups, and agmatine, and the pharmaceutically acceptable acid addition salts thereof.

4,507,322
PHARMACEUTICAL COMPOSITION USEFUL FOR IMPROVEMENT AND/OR TREATMENT OF MENTAL SYMPTOMS CAUSED BY ORGANIC DISORDER IN BRAIN

Shizuo Kuriyama, Ooi, and Mikio Saitoh, Ashiya, both of Japan, assignors to Eisai Co., Ltd. and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,247
Claims priority, application Japan, Sep. 22, 1982, 57-165546
Int. Cl.³ A61K *31/135*
U.S. Cl. 514—648 **3 Claims**

1. A method for improving and/or treating a patient afflicted with a mental symptom caused by a cerebrovascular disease or senile dementia in the brain, which comprises:

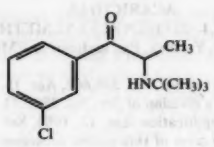
administering to said patient a therapeutically effective amount of 2-(4-methylaminobutoxy)diphenylmethane or a pharmaceutically acceptable salt thereof as an active ingredient in combination with a pharmaceutically acceptable carrier.

4,507,323
TREATMENT OF PSYCHOSEXUAL DYSFUNCTIONS

Warren C. Stern, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 25, 1984, Ser. No. 634,451
Int. Cl.³ A61N *31/135*
U.S. Cl. 514—649 **12 Claims**

1. A method of treating psychosexual dysfunction in a human being suffering from same, which comprises administering to said human being an effective, non-toxic, sexual dysfunction therapeutic amount of the compound of the formula (I)



(I)

or a pharmaceutically acceptable salt thereof.

4,507,324
ANTISOILING NYLON CARPET YARNS

Salvador Olive', and Gisela Olive', both of Cantonment, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 470,734, Mar. 7, 1983, abandoned, and Ser. No. 479,194, Apr. 1, 1983, abandoned, said Ser. No. 470,734, is a continuation of Ser. No. 395,538, Jul. 6, 1982, abandoned, said Ser. No. 479,194, is a continuation of Ser. No. 398,054, ,. This application Oct. 3, 1983, Ser. No. 538,399
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—375 **15 Claims**

1. A coated polyamide fiber comprising a polyamide fiber coat with a copolymer having a carbon-carbon backbone with substituent groups pendant therefrom some of which contain fluorine atoms attached directly to aliphatic carbon atoms and others of which are reactive groups capable of reacting with amide linkages of the polyamide fiber and wherein the copolymer coating is chemically bonded to the fiber between said reactive groups and said amide linkages of the polyamide fiber, and, wherein said coated fiber comprises sufficient fluorine atoms to provide at least 100 ppm of fluorine, based on the weight of fiber.

4,507,325
PROCESS OF BREWING WITH AN ADJUNCT OF HIGHLY FERMENTABLE SUGAR

Kenneth H. Geiger, London, Canada, assignor to Labatt Brewing Company Limited, London, Canada

Continuation-in-part of Ser. No. 123,978, Feb. 25, 1980, abandoned, which is a continuation of Ser. No. 937,776, Aug. 29, 1978, abandoned. This application Apr. 16, 1980, Ser. No. 140,874
Int. Cl.³ C12C *11/00, 5/00*; C12G *3/00*
U.S. Cl. 426—16 **35 Claims**

1. In a brewing process wherein a malt wort is prepared; supplemented with a sugar adjunct, fermented with brewers' yeast; and, following completion of the fermentation, finished to the desired alcoholic brewery beverage; the improvement comprising initially fermenting a malt wort with brewers' yeast to produce a yeast population at least about one-half of the maximum amount of population development obtainable during the fermentation, thereby providing a partially fermented wort, thereafter introducing an adjunct comprising a highly fermentable sugar into the partially fermented wort over a period of time such that the Plato value of the fermenting wort substantially does not increase and osmotic shock is avoided, and then continuing the fermentation.

4,507,326
STRATIFIED CHROMATICALLY DISTINCT SHERBET CONFECTION AND METHOD OF MAKING SAME

Jeffrey W. Tarantino, Wilbraham, Mass., assignor to Friendly Ice Cream Corporation, Wilbraham, Mass.

Filed Jun. 27, 1983, Ser. No. 508,257
Int. Cl.³ A23G *9/04, 9/28*
U.S. Cl. 426—101 **6 Claims**

1. A method of forming selectively shaped and chromatically distinct stratified sherbet confections comprising the steps of

independently feeding at least a first and a second chromati-

cally distinct and partially prefrozen sherbet into a selectively shaped extrusion head,

conjointly extruding said chromatically distinct and partially prefrozen sherbets from said extrusion head in the form of a unitary composite internally interfacially engaged product of selective external contour and having a plurality of chromatically distinct cross-sectional strata,

spraying a thin water coating upon external exposed surfaces of said composite product,

quickly thereafter reducing the temperature of the external exposed surfaces of said composite product by exposure to a spray of liquid nitrogen to form a rigid frozen crust thereon,

and subsequently reducing the temperature of the remainder of said composite product to convert the same into a substantially solid self supporting transportable structure.

4,507,327

PROCESS FOR PREPARING EDIBLE PRODUCTS IN THE FORM OF CAPSULES

Tsunesuke Ueda, Hino, Japan, assignor to Q.P. Corporation, Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,197
Int. Cl.³ A23L *1/04, 1/27*
U.S. Cl. 426—276 **15 Claims**

1. A process for preparing edible products in the form of capsules filled with an edible liquid by conducting the following steps:

a. preparing core liquid by adding calcium salt to sugar liquid;

b. forming membranes of mainly calcium alginate on the surface of the core liquid by dropping the core liquid into alginic acid salt liquid and thereby surrounding the core liquid with these membranes to form capsules;

c. exchanging the core liquid in the capsules with water by soaking the capsules of the core liquid in water to remove therefrom any unreacted calcium salt;

d. exchanging the core liquid in the capsules with an edible liquid by immersing the water-filled capsules in the edible liquid.

4,507,328

INSTANTIZED MIXTURE OF SOYA PROTEIN AND CASEINATE

Abraham Schapiro, deceased, late of Kentfield, Calif., and Mable S. Schapiro, executor, P.O. Box 548, Kentfield, Calif. 94904

Continuation-in-part of Ser. No. 895,356, Apr. 11, 1978, Pat. No. 4,209,545, Ser. No. 851,710, Nov. 15, 1977, abandoned, Ser. No. 726,612, Sep. 27, 1976, abandoned, Ser. No. 430,230, Jan. 2, 1974, Pat. No. 3,988,511, and Ser. No. 156,040, Jun. 23, 1971, abandoned. This application Feb. 4, 1980, Ser. No. 118,452
The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.
Int. Cl.³ A23J *3/00*; A23L *1/20*; A23C *23/00*
U.S. Cl. 426—580 **9 Claims**

1. Instantized mixture of soya protein and caseinate containing more the 75% caseinate and less than 25% but not less than about 0.5% soya protein based on the quantity of soya protein and caseinate, the caseinate being selected from the group of sodium casinate, calcium caseinate and mixtures of the two, said instantized soya protein being the product of an incremental process in which a small quantity of soya protein is blended with a surfactant and further increments of soya protein small in comparison to the total soya protein are blended, in succession, with previous blends with thorough blending at each step before the next increment is added.

4,507,329

MIXED SOLVENT EXTRACTION OF HOPS

Herbert L. Grant, Yakima, Wash., assignor to S. S. Steiner, Inc., New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,370
Int. Cl.³ C12C *3/00, 9/02*; A23L *1/28*
U.S. Cl. 426—600 **12 Claims**

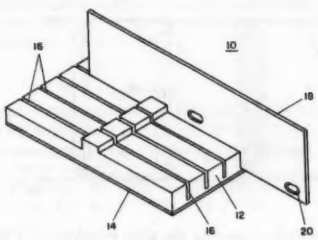
5. In a method for the selective solvent extraction of alpha acids from hops by contacting said hops with liquid carbon dioxide, the improvement which comprises enhancing the solubility of said alpha acids in said liquid carbon dioxide by conducting said extraction in the presence of a 1 to 4 carbon atom aliphatic alcohol in an amount of about 0.1 to about thirty volume percent of said solvent mixture, which alcohol: (1) is non-reactive with said alpha acids, and (2) has the following physical properties: (a) is completely soluble in said liquid carbon dioxide in the operating conditions and concentration employed, and (b) is itself a solvent for said alpha acids.

4,507,330

PLATING METHOD USING EXPANDABLE MASKING BED

Theodore F. Schaaf, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,339
Int. Cl.³ B05D *1/32, 5/00*
U.S. Cl. 427—261 **9 Claims**



1. A method of plating a selective portion of an article in a heated plating bath comprises:

preparing the article for immersion into the plating bath;

placing the article into a holder therefor, said holder comprising a rigid base, a heat expandable resilient bed having a plurality of spaced article retaining slits therein mounted to said base, said slits being of such shape and width as to firmly retain the article and mask the portions of the article from reaction by the heated plating bath due to thermal expansion of the bed material upon immersion into the plating bath;

immersing the article and holder into the heated plating bath for a length of time sufficient to allow the desired plating to take place in areas not masked by the heat expandable bed.

4,507,331

DRY PROCESS FOR FORMING POSITIVE TONE MICRO PATTERNS

Hiroyuki Hiraoka, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,638
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—38 **7 Claims**

1. A dry process for forming a positive tone micro pattern with high resolution and high aspect ratio, said process comprising the steps of:

(1) depositing an organic polymer film on a substrate;

(2) depositing an oxygen etch barrier film on said organic polymer film said oxygen etch barrier film consisting of an

organometallic, including ogranosilicon compound or a metal;

(3) patternwise exposing said barrier film to a low energy proton beam,

and

(4) developing the pattern by means of oxygen reactive ion etching.

4,507,332

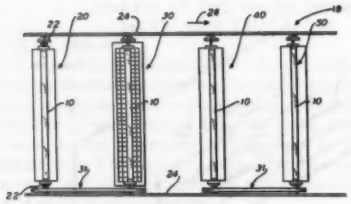
METHODS FOR COATING THE GLASS ENVELOPE AND PREDETERMINED PORTIONS OF THE END CAPS OF A FLUORESCENT LAMP

James D. Nolan, 623 Little Silver Point Rd., Little Silver, N.J. 07739 and Axel T. Karlsson, 94 Townsend Dr., Middletown, N.J. 07748

Division of Ser. No. 404,499, Aug. 2, 1982, , and a continuation-in-part of Ser. No. 196,077, Oct. 10, 1981, abandoned, which is a continuation of Ser. No. 44,473, Jun. 1, 1979, abandoned, which is a continuation of Ser. No. 940,292, Sep. 7, 1978, abandoned, which is a continuation of Ser. No. 759,823, Jan. 17, 1977, abandoned. This application Jul. 25, 1983, Ser. No. 516,658

Int. Cl.³ H01J *61/35*

U.S. Cl. 427—67 **11 Claims**



1. A method of coating the glass envelope of a fluorescent lamp and a predetermined portion of the end caps of said lamp with a coating of polymeric material and wherein said lamp is provided with at least one electrical connecting pin on each end cap and wherein said end caps are secured to said glass envelope at radial positions with respect thereto, said method comprising:

(a) securing said end caps against radial displacement with respect to said glass envelope;

(b) subsequently, preheating said fluorescent lamp to heat said glass envelope and at least said predetermined portion of said end caps to a first predetermined temperature above the melting point of said polymeric material for a first predetermined period of time;

(c) subsequently, masking said pins and all of said end caps except said predetermined portion thereof;

(d) exposing said glass envelope and said predetermined portion of said end caps to a fluidized bed of powder of said polymeric material for a second predetermined period of time to apply a coatiing of said powder to said glass envelope and to said predetermined portion of said end caps;

(e) subsequently, reheating said glass envelope and at least said predetermined portion of said end caps to a second predetermined temperature above said melting point of said polymeric material for a third predetermined amount of time to melt and fuse said powder on said glass envelope and said predetermined portion of said end caps to form said applied powder into a substantially uniformly thick coating of polymeric material; and

(f) subsequently, unmasking said pins and said end caps and unsecuring said end caps.

4,507,333

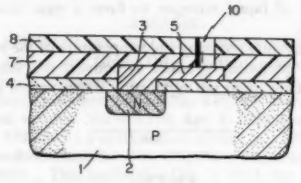
BIPHENYLENE END-CAPPED QUINOXALINE POLYMERS AND THEIR USE AS INSULATING COATINGS FOR SEMICONDUCTOR DEVICES

Arnold I. Baise, Poughkeepsie, N.Y., and Anthony W. Wu, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,251

Int. Cl.³ B05D *3/02, 5/12;* **C08G** *69/08;* **C07D** *241/36*

U.S. Cl. 427—82 **9 Claims**



1. A method of forming an insulating layer on a surface of a compatible substrate comprising,

forming a discrete layer of curable biphenylene end-capped quinoxaline prepolymer on said substrate, and

curing coated substrate to polymerize said prepolymer.

2. The method of claim 1 wherein said surface comprises a conductive pattern on said substrate.

3. The method of claim 2 wherein said substrate comprises a dielectric.

4. The method of claim 2 wherein said substrate surface comprises a passivating coating on a semiconductor device having at least one integrated circuit therein.

4,507,334

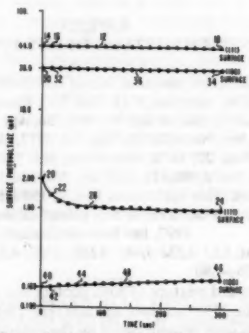
SURFACE PREPARATION FOR DETERMINING DIFFUSION LENGTH BY THE SURFACE PHOTOVOLTAGE METHOD

Alvin M. Goodman, Princeton Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,012

Int. Cl.³ H01L *21/66*

U.S. Cl. 427—93 **4 Claims**

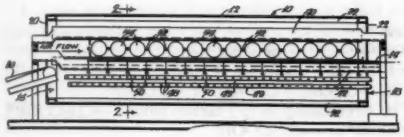


1. A method of treating the surface of a sample of n-type silicon material in preparation for determining the minority carrier diffusion length of the material by the surface photovoltage method comprising the steps of:

(a) applying to said surface an aqueous solution consisting essentially of a strong oxidizing agent selected from the group consisting of potassium permanganate [$KMnO_4$], potassium dichromate [$K_2Cr_2O_7$], and ammonium dichromate [$(NH_4)_2Cr_2O_7$],

(b) rinsing said surface with distilled water to remove residue of said oxidizing agent from said surface; and
(c) drying said rinsed surface in a clean ambient.

4,507,335
METHOD AND APPARATUS FOR PELLETIZING SULPHUR
Krishna S. Mathur, Calgary, Canada, assignor to Procor Limited, Alberta, Canada
Filed Feb. 13, 1984, Ser. No. 579,686
Int. Cl.³ B05D *7/00;* **B22F** *3/00*
U.S. Cl. 427—215 **22 Claims**



1. A method of continuously generating sulphur seed particles within a rotating drum that are capable of having their size increased to form sulphur pellets larger than predetermined size, comprising the steps of:
(a) forming an elongated bed of solid sulphur particles of various sizes;
(b) rotating said bed within a rotating drum;
(c) continuously elevating said solid sulphur particles from said bed in said drum;
(d) dropping the elevated particles in a generally continuous curtain of solid sulphur particles which fall back into said bed;
(e) spraying liquid sulphur particles onto said curtain of falling solid sulphur particles to coat and increase the size of said falling solid sulphur particles; and
(f) continuously controlling the temperature of a predetermined portion of said bed in the range of about 180° to 230° F., whereby a predetermined first portion of the liquid sulphur particles are solidified into sulphur seed particles and drop out prior to contacting said curtain of falling solid sulphur particles.

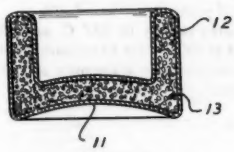
4,507,336
METHOD FOR PROTECTING A SUBSTRATE WITH A MULTI-DENSITY COMPOSITE POLYURETHANE
Louis F. Cenegy, 25411 Teton Way, El Toro, Calif. 92630
Filed Feb. 1, 1982, Ser. No. 344,504
Int. Cl.³ B05D *5/00, 1/02, 1/34*
U.S. Cl. 427—244 **5 Claims**

1. A method for protecting a substrate comprising the steps of:
applying a layer of low density polyurethane foam to the substrate,
providing a volatile-free A component containing an isocyanate urethane precursor,
providing a volatile-free B component containing a polyol urethane precursor,
mixing a spray of catalyst means and said A component and said B component to provide a volatile-free spray of polyurethane precursors,
spraying said substantially volatile-free spray onto the surface of said low density foam while maintaining said foam at a temperature within the range from about 40° F. to about 120° F., and
reacting said polyurethane precursors in a reaction time up to about ten seconds to form an essentially non-porous elastomeric polyurethane coating above about 20 mils in thickness and having a hardness above about 20 Shore A.

4,507,337
PROCESS FOR PRODUCING A PREPREG OF A GLASS FIBER CLOTH
Shigeo Yamaguchi, and Tadayoshi Okutsu, both of Fukushima, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima, Japan
Filed Jul. 5, 1984, Ser. No. 627,752
Claims priority, application Japan, Jul. 6, 1983, 58-122748
Int. Cl.³ B05D *3/02, 3/12*
U.S. Cl. 427—269 **4 Claims**

1. A process for producing a prepreg of a glass fiber cloth by impregnating said glass fiber cloth with a thermosetting resin varnish and drying the impregnated glass fiber cloth, characterized by heat-treating the inner portions of the selvages of the glass fiber cloth to remove the residual stress of glass fibers in the glass fiber cloth, coating the heat-treated portions of the glass fiber cloth with a solution of a saturated polyester type resin of 150° to 180° C. softening point insoluble in said thermosetting resin varnish so that the amount coated becomes 4 to 10% by weight as resin based on the weight of the portions of glass fiber cloth coated, drying the resulting glass fiber cloth, removing the selvage portions of the glass fiber cloth by cutting, impregnating the selvages-removed glass fiber cloth with the above mentioned thermosetting resin varnish, and drying the impregnated glass fiber cloth.

4,507,338
CONTAINER COMPRISING A POLYSULFONE RESIN LAYER WITH A CELLULAR RESIN CORE
Richard A. Freundlich, Exton, Pa., assignor to Polymer Projections, Inc., Flourtown, Pa.
Filed Jun. 30, 1983, Ser. No. 509,344
Int. Cl.³ B32B *1/02, 3/26, 27/08*
U.S. Cl. 428—35 **9 Claims**



1. A container for food products transparent to microwaves for use in a microwave oven having a cellular inner core of about 0.25 to about 1.0 inch in thickness composed of a resin having a softening point of over about 100° C., and a thin, non-foamed outer covering of from about 0.0005 to about 0.040 inch in thickness, of an amorphous, thermoplastic polysulfone resin.

4,507,339
COATED METAL CONTAINER AND METHOD OF MAKING THE SAME
Adelaida L. Carbo; Raymond H. Good, both of Barrington, and Richard J. Karas, Addison, all of Ill., assignors to American Can Company, Greenwich, Conn.
Continuation of Ser. No. 339,634, Jan. 15, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,082
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—35 **10 Claims**

1. A method of forming a coated metal container which comprises the steps of:
(1) applying a lubricant comprising a citric acid ester to both

surfaces of ferrous metal stock, said ester being applied in an amount within the range of 10 to 40 milligrams per square foot of the total metal stock surface;

(2) subjecting said lubricated metal stock to multiple drawing or drawing and ironing to form a seamless metal container;

(3) applying a synthetic resin coating as a top coat to at least the interior surface of said lubricated metal container without removing the lubricant from the container surface; and

(4) subjecting the lubricated, coated container to elevated temperature to cure the topcoat, said lubricant being effective to react with said top coat resin to form a continuous, adhered film on the container surface.

4,507,340

ADHESIVES AND DEVICES COATED THEREWITH

James A. Rinde, Fremont; Eugene F. Lopez, Sunnyvale, and Leon C. Glover, Los Altos, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 31, 1980, Ser. No. 173,946

Int. Cl.³ F16L *11/00*

U.S. Cl. 428—36 **29 Claims**

1. A heat-recoverable device which recovers at a temperature of 100° C. and which comprises an elastically deformed member held in an elastically deformed state by a polymeric restraint which, when heated, weakens, but does not melt or flow, at a temperature between 100° and 200° C. and thus permits elastic recovery of said elastically deformed member, said device having on a surface thereof which can contact another surface as a result of such elastic recovery a layer of a curable adhesive composition which

(a) is solid, substantially free of cross-linking and substantially tack-free at 25° C.;

(b) after having been heated rapidly to 80° C., maintained at 80° C. for 10 days, and heated rapidly to 150° C., has a viscosity at 150° C. of at most 5×10^4 poise;

(c) when heated rapidly to 150° C. has an initial viscosity at 150° C. of 10^3 to 10^4 poise and after having been maintained at 150° C. for 1 hour has a viscosity at 150° C. of at most 5×10^4 poise; and

(d) when heated rapidly to 200° C. and after having been maintained at 200° C. for 10 minutes is substantially void-free and has cured to a viscosity at 200° C. of at least 5×10^5 poise.

4,507,341

CARBON FIBRE STRUCTURES

Mark J. Heseltine, Crewkerne, England, assignor to Westland plc, Yeovil, England

Filed Feb. 17, 1984, Ser. No. 581,191

Claims priority, application United Kingdom, Feb. 24, 1983, 8305161

Int. Cl.³ H01Q *1/28*; H01R *3/00*

U.S. Cl. 428—78 **9 Claims**

1. A resin bonded carbon fibre structure having a portion of its surface area adapted to provide a low electrical impedance connection for mounting a device such as a radio antenna, characterised in that said surface area portion comprises an exposed dimpled electrically conductive metal shim bonded to the structure.

4,507,342

POLYMERS ADHERENT TO POLYOLEFINS

Andrew J. Kielbania, Jr., Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

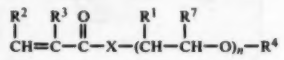
Division of Ser. No. 282,121, Jul. 10, 1981, Pat. No. 4,424,240, which is a division of Ser. No. 037,069, May 8, 1979, Pat. No. 4,288,499. This application Oct. 19, 1983, Ser. No. 543,589

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—90 **15 Claims**

1. An article comprising an untreated polyolefin substrate and adherent thereto, a blend of a first latex polymer and a vinyl addition adherent latex polymer of monomers consisting essentially of (1) at least 5% by weight of a primary monomer selected from

(a) monomers having the formula



wherein

X is —O—, —NH— or —NR^5—;

R^1 and R^7, individually, are H, methyl or ethyl;

R^2 is H, —COOH, —$CONH_2$, or —$COOR^6$;

R^3 is H, alkyl having up to 5 carbon atoms, —CH_2COOR^6, —$COOR^6$ or —CH_2COOH;

R^4 and R^5, individually are monocyclic alkyl having six to twenty carbon atoms, acrylic alkyl having nine to twenty carbon atoms, or alkaryl having nine to eighteen carbon atoms;

R^6 is hydrocarbyl; and

n having a value of from zero to about ten;

(b) vinyl esters of alkanoic acids having eight to twenty carbon atoms;

(c) alkyl substituted styrene wherein the substituent group or groups have a total of three to fifteen carbon atoms; and

mixtures thereof; said adherent polymer having surface energy properties such as to form a stable bond with said substrate.

2. The article of claim 1 wherein the substrate is a flock.

4,507,343

NON-SLIP PILE FABRIC AND METHOD OF MANUFACTURING THE SAME

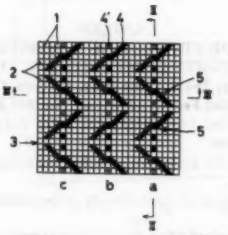
Iwao Yabu, 5-21, Tezukayamahigashi 2-chome, Sumiyoshi-ku, Osaka, Japan

Filed Apr. 27, 1984, Ser. No. 604,498

Claims priority, application Japan, Dec. 22, 1983, 58-243144

Int. Cl.³ B32B *33/00*

U.S. Cl. 428—93 **2 Claims**



1. A non-slip pile fabric comprising a ground fabric formed of warps and wefts, and pile yarns of rigidity wound into said ground fabric so that said pile yarns will raise from one side of said ground fabric substantially in the shape of letter V forming an angle of substantially 45 degrees with respect to said warps and with respect to the surface of said ground fabric, adjacent ones of said pile yarns raising in alternate directions, the piled

surface on said one side of the ground fabric being coated with a thermosetting synthetic resin.

4,507,344

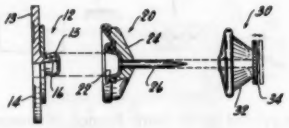
PIN WITH DETACHABLE FACE

Daniel G. Baughman, P.O. Box 541, Darien, Wis. 53114

Filed Feb. 1, 1984, Ser. No. 575,774

Int. Cl.³ A44C 3/00; B32B 3/06

U.S. Cl. 428—99 **2 Claims**



1. A pin comprising a face member having a first generally planar face surface and a rear surface, a protrusion extending from said rear surface and being integral with said face member, a snap means secured to said protrusion, said pin also comprising a base means having a snap receptacle adapted to releasably receive said snap means and an elongate pin shaft secured thereto.

4,507,345

ADAPTER FORMED FROM A COMPOSITE FOAMED ADAPTER BLOCK HAVING FLUID CHANNELS AND A PROCESS FOR ITS MANUFACTURE

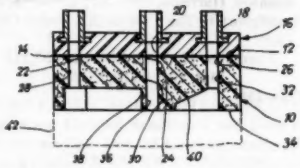
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glättli, Seestrasse 252, CH-8700 Küsnacht, Switzerland

Filed Jun. 4, 1982, Ser. No. 385,245

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124020

Int. Cl.³ B29D 27/00; B32B 5/18

U.S. Cl. 428—137 **10 Claims**



1. An adapter which is adapted for use in a fluid control system, which includes an adapter block having a fluid channel therethrough, which includes a member adhesively secured to one side of said adapter block, and which is produced by a process comprising the steps of: introducing a quantity of a foamable synthetic resin into a mold cavity having a rod extending therethrough, said quantity of said foamable synthetic resin being sufficient to cause the resulting foam to completely fill said mold cavity; thereafter waiting a first predetermined interval of time while said foamable synthetic resin expands in volume to fill said mold cavity; thereafter waiting a second predetermined interval of time while said foamable synthetic resin solidifies, the portions of said foamable synthetic resin adjacent surfaces of said mold cavity and said rod forming an integral, solid skin around the remainder of said synthetic resin and said remainder forming a foam core, the resulting object being said adapter block and said rod in said mold cavity defining said fluid channel therethrough; thereafter removing said adapter block from said mold cavity; thereafter machining said adapter block on said one side thereof so as to remove said skin from said one side thereof; thereafter applying an adhesive to at least one of a surface of said member and said one side of said adapter block; thereafter placing said surface of said member against said one side of said adapter block; and thereafter waiting a third predetermined interval of time sufficient to permit said adhesive to cure.

4,507,346

MULTILAYER IDENTIFICATION CARD AND A METHOD OF PRODUCING IT

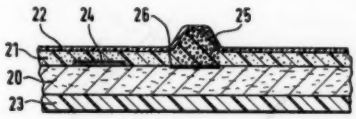
Thomas Maurer; Hans-Jürgen Holbein, and Joseph S. Lass, all of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1983, Ser. No. 478,714

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213315

Int. Cl.³ A23C 9/12; B32B 3/30

U.S. Cl. 428—158 **30 Claims**



1. A multilayer identification card comprising a plurality of layers of material, at least one card surface made of synthetic material bearing a structure in relief useable as a printing block, wherein the structure in relief (**13, 25, 35, 45, 55, 65, 67**) is formed of foamable synthetic material (**11, 21, 31, 44, 54, 64, 71**) which has been foamed by absorption of energy from an energy source irradiating the card surface.

4,507,347

LAMINATE

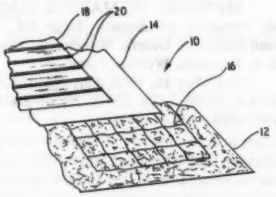
Donald B. Lupton, The Boat House, Slipper Hill, Foulbridge, Colne, Lancashire, England

Filed Mar. 18, 1983, Ser. No. 476,500

Claims priority, application United Kingdom, Mar. 31, 1982, 8209570

Int. Cl.³ B32B 3/00

U.S. Cl. 428—166 **9 Claims**



1. A laminate for use as a building material which comprises at least three separate layers laminated together and comprising the following elements:

an opaque embossed vinyl plastics material sheet constituting a decorative element forming one surface of the laminate which will be visible in use;

a vapour barrier element to prevent the passage of water vapour through the laminate; and

an anti-wrinkle element of sufficient flexural stiffness to prevent wrinkling of the laminate and of sufficient flexibility to allow the laminate to be rolled up for storage and transport, the stiffness of the anti-wrinkle element being such that a one inch wide strip of the material placed on two points twenty-four inches apart is self-supporting, and the flexibility of the anti-wrinkle element being such that

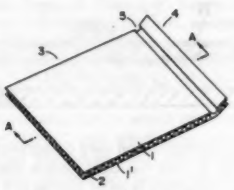
at least the twenty-four inch length of said strip can be rolled up into a roll of at most two inches in diameter.

4,507,348

CORRUGATED BOARD-LIKE SHEET MADE OF SYNTHETIC RESIN

Michiaki Nagata, Tokyo, and Koji Nakashima, Hiroshima, both of Japan, assignors to Mitsui Petrochemical Industries, Tokyo, Japan

Continuation of Ser. No. 280,074, Jul. 2, 1981, abandoned. This application Apr. 5, 1983, Ser. No. 481,016
Claims priority, application Japan, Aug. 29, 1980, 55-119572
Int. Cl.³ B32B *3/30*
U.S. Cl. 428—172 **7 Claims**



1. A corrugated board-like sheet made of a synthetic resin, comprising an interlining core and liners fused on both upper and lower sides of said core, having at least one flap portion provided continuous to said sheet through a bending portion in which the liners and the interlining core are compressed and fused into one continuous layer to provide a hinge effect.

4,507,349

SECURITY MEDIUM AND SECURE ARTICLES AND METHODS OF MAKING SAME

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06066, and Robert F. Gracia, Woodstock, Conn., assignors to Howard A. Fromson, Weston, Conn.

Filed May 16, 1983, Ser. No. 494,833
Int. Cl.³ B32B *3/00, 15/08, 27/36;* B41M *3/14*
U.S. Cl. 428—195 **19 Claims**

1. A secure article resistant to counterfeiting and unauthorized alternation, said article comprising first and second layers of synthetic material, at least one of said layers being receptive of and substantive to sublimatable dye, a barrier layer intermediate to and contacting each of said first and second layers, said barrier layer being substantially impenetrable by sublimated dye under imaging conditions, and, within at least one of said first and second layers, an image comprising at least one sublimated dye.

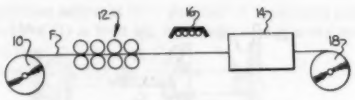
10. A method of making a secure article resistant to counterfeiting and unauthorized alteration, said method comprising the steps of providing a security medium comprising first and second layers of synthetic material, at least one of said layers being receptive of and substantive to sublimatable dye, and a barrier layer intermediate to and contacting each of said first and second layers, said barrier layer being substantially impenetrable by sublimated dye under imaging conditions; and forming an image comprising at least one sublimated dye within said synthetic layer which is receptive of and substantive to sublimatable dye.

4,507,350

METHOD OF PRODUCING OPAQUE PRINTED TEXTILE FABRICS WITH CURING BY FREE RADICAL INITIATION AND RESULTING PRINTED FABRICS

James E. Hendrix, Spartanburg, S.C., and John Y. Daniels, Pineville, N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Mar. 8, 1984, Ser. No. 587,397
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—196 **16 Claims**



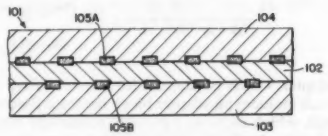
11. A printed textile fabric formed of interengaged yarns of a predetermined color, selected areas of said fabric having printed pattern areas of predetermined color contrasting with the color of said yarns, said printed pattern areas being substantially opaque and thus unaffected by the color of said yarns, and said pattern areas comprising an opaque coating covering the exposed surfaces of the interengaged yarns, said coating comprising an opacifying pigment providing opacity in said coating and a free radical polymerized binder bonding said opaque coating to the yarns.

4,507,351

STRONG LAMINATE

Robert C. Johnson, Harrison, and Larry E. Burns, Goshen, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jan. 11, 1983, Ser. No. 457,313
Int. Cl.³ B32B *27/14*
U.S. Cl. 428—198 **56 Claims**



1. A three-ply laminate comprising:

A. Absorbent paper tissue outer plies each having a basis weight of 7 to 130 g/m^2;

B. A flexible tear reinforcing center ply having a tear strength of at least 300 gms.; and

C. A thermoplastic net adhesive material originally having uniformly spaced solid thick thermoplastic masses connected by oriented thermoplastic strands which are thinner than said solid masses;

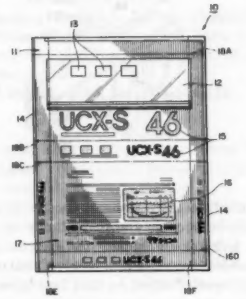
wherein the outer plies (A) are bonded to the upper and lower surfaces of said center ply (B) by the adhesive (C), wherein less than 30% of said solid masses are fully penetrated into the center ply; and wherein said laminate has an Elmendorf tear strength equal to at least 50% of the tear strength of the reinforcing center ply, and wherein said laminate has a dry peel strength of greater than 100 gms.

4,507,352

OVERWRAPPING FILM

Katsuhiko Shibata, Miyagi, and Mitsuyoshi Sato, Sendai, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 410,971
Claims priority, application Japan, Oct. 15, 1981, 56-164569
Int. Cl.[3] B44F 1/00; B32B 7/06
U.S. Cl. 428—201 5 Claims



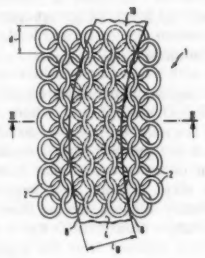
1. An overwrapping film comprising:
a transparent base film;
an anchor coat layer bonded to an underside of said base film, said anchor coat layer comprising a material having a configuration of a first pattern;
an ink layer positioned on said anchor coat layer and having a second pattern which is contained within, and occupies only a portion of said first pattern, said ink layer being at least partially visible through said base film and said anchor coat; and
a metal layer coextensive with said first pattern and bonded to said ink layer and to portions of said anchor coat layer extending beyond said ink layer, said metal layer imparting a metallic gloss to the ink layer as seen through said base film and anchor coat layer and said metal layer further providing a respective metal color at said portions of the anchor coat layer extending beyond the ink layer.

4,507,353

METAL RING FABRIC FOR PROTECTIVE CLOTHING

Gerhard Kuhlmann; Gerhard Schleihauf, and Emil Brandauer, all of Mühlacker, Fed. Rep. of Germany, assignors to Friefrich Munch GmbH & Co. KG., Mühlacker, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,482
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305841
Int. Cl.[3] D03D 13/00
U.S. Cl. 428—222 24 Claims



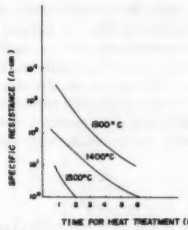
1. In a metal ring fabric for protective clothing, the improvement residing in the provision of stiffening strips, which consist of flexible material and cover only part of the area of said metal ring fabric and in which strip-shaped portions of the metal ring fabric are embedded.

4,507,354

ELECTROMAGNETIC WAVE ABSORBERS OF SILICON CARBIDE FIBERS

Toshikatsu Ishikawa, Tokyo; Hiroshi Ichikawa, Yokohama; Yoshikazu Imai, Tokyo; Tokuji Hayase, Chigasaki, and Yoichi Nagata, Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,249
Claims priority, application Japan, Mar. 31, 1982, 57-51034
Int. Cl.[3] B32B 7/00
U.S. Cl. 428—245 5 Claims



1. The composite of a metal plate which is aluminum or steel and an electromagnetic wave absorber which comprises said metal plate and an electromagnetic wave absorbing layer consisting essentially of silicon carbide fibers having a specific electrical resistance of 10°–$15^{5}\Omega$·cm.

4,507,355

REFRACTORY-BINDER COATED FABRIC

Stephen George, and Thomas H. George, both of Clinton, N.J., assignors to Pyro Technology Corp., Hartsdale, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,909
Int. Cl.[3] B32B 7/00
U.S. Cl. 428—246 6 Claims

1. A heat resistant refractory coated fabric composition comprising:
(a) a base fabric, and
(b) a refractory coating comprising refractory materials and the inorganic binder composition comprising:
colloidal silica;
monoaluminum phosphate;
aluminum chlorohydrate; and
an amount of an alkyl tin halide catalyst effective to increase the bonding of said composition when applied to a substrate,
said refractory coating bonded to the surfaces of the fabric, and said refractory materials being capable of providing flame abrasion resistance and heat resistance to the base fabric at elevated temperatures.

4,507,356

MOISTURE-PERMEABLE SHEETS

Nobuo Watabe, Tokyo, Japan, assignor to Aderans Company, Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,690
Claims priority, application Japan, May 20, 1982, 57-83990
Int. Cl.[3] B32B 7/00
U.S. Cl. 428—252 4 Claims

1. A multi-layer sheet comprising a first layer of a poly-α-amino acid derivative film having embedded therein a reinforc-

ing material selected from the group consisting of woven fabric and knitted fabric made of nylon or polyester, and a second layer of a polyurethane elastomer film, at least one of said first and second layers being moisture permeable.

4,507,357

SHOE STIFFENERS

Roger Lester, Cropston, England, assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 400,451, Jul. 21, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,803

Int. Cl.³ A43B *23/16*; B29C *27/04*

U.S. Cl. 428—278 **37 Claims**

1. A shoe stiffener comprising a textile fabric impregnated with an aqueous stiffening composition with is subsequently dried and which comprises a stiffening polymeric material, an amount of a particulate plasticiser between about 1% to about 15% based on the dry weight of the stiffening composition, said plasticiser being solid at normal room temperature and having little or no plasticising effect at normal room temperatures but which has a plasticising effect at temperatures commonly used in the activation of heat activatable shoe stiffener elements, from 3% to 30% based on the dry weight of the stiffening composition of an aminoplast resin which migrates to the surface of the stiffening composition and cures during drying of the stiffening composition and, optionally, other usual additives.

4,507,358

INSULATING PAPER SHEET OF SYNTHETIC RESIN FLAKES AND NATURAL FIBERS

Michio Takaoka; Tsuneaki Moutai, and Isao Miura, all of Tokyo, Japan, assignors to The Fujikura Cable Works, Limited, Tokyo, Japan

PCT No. PCT/JP80/00057, § 371 Date Nov. 30, 1981, § 102(e) Date Nov. 30, 1981, PCT Pub. No. WO81/02944, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 1, 1980, Ser. No. 328,580

Int. Cl.³ B32B *27/32*; D21H *5/12*

U.S. Cl. 428—298 **2 Claims**

1. An insulating paper sheet which is produced by laminating first and second sheet components with heat and pressure, each of said sheet components being prepared by mixing synthetic resin flakes having a thickness of 5 to 9 microns and a length of 2 to 5 millimeters with natural fibers to provide a composite paper mass, said synthetic resin flakes being mixed with natural fibers in the weight ratio ranging between 4:6 and 6:4, and wherein the mutually facing portions of the laminated insulation paper sheet components contain a larger amount of synthetic resin flakes than in any other portion of the laminated mass.

4,507,359

ELECTROMAGNETIC SHIELDING

Donald H. Powers, Jr., Needham, Mass., assignor to Chomerics, Inc., Woburn, Mass.

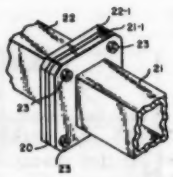
Division of Ser. No. 219,069, Dec. 22, 1980, Pat. No. 4,434,541. This application Nov. 7, 1983, Ser. No. 549,164

Int. Cl.³ B32B *15/02*; B22F *1/02*

U.S. Cl. 428—328 **26 Claims**

1. An electromagnetic energy shielding material having a volume resistivity to be effective as an electromagnetic energy shield, said material comprising a resin matrix loaded with electrically conductive, irregularly shaped particles, said particles comprising an aluminum core having a first layer of tin and a second layer of silver on said first layer.

12. A material having a volume resistivity to be effective as an electromagnetic energy shield comprising a resin matrix loaded with irregularly shaped particles, said particles comprising an aluminum core, a first layer of nickel on said aluminum and a second layer of silver on said first layer.



15. A material having a volume resistivity to be effective as an electromagnetic energy shield comprising a resin matrix loaded with irregularly shaped particles, said particles comprising an aluminum core, a first layer of zinc on said aluminum and a second layer of silver on said first layer.

4,507,360

CORROSION RESISTANT CORE-PLATE AND COATINGS THEREFOR

Bruno M. Perfetti, Jeannette, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 541,613, Oct. 13, 1983,. This application Mar. 1, 1984, Ser. No. 584,978

Int. Cl.³ B32B *15/08*

U.S. Cl. 428—336 **5 Claims**

1. Method of protecting metal comprising applying to said metal a coating of a composition comprising a solution or dispersion in an aqueous medium of a composition comprising:

a. quaternary ammonium silicate of the formula $WM_2O.X(N_nR_p)_2O.YSiO_2ZH_2O$ where W is a number from 0 to 1, X is a number from 0.33 to 1.5, Y is a number from 2 to 10, Z is a number from 1 to 20, M is an alkali metal, R is an organic radical that forms an NR base selected from alkyl, alkanol, and heterocyclic groups, each independently selected, having from 1 to 20 carbon atoms, n is an integer from 1 to 10, and p is at least 4, and

b. ethylene polymer selected from the group consisting of copolymers, terpolymers and ionomers of ethylene with acrylic, methacrylic or crotonic acids or esters thereof or vinyl acetate, wherein the portion of ethylene polymer derived from ethylene is from about 60 to about 90 weight percent, the weight ratio of SiO_2 derived from the quaternary ammonium silicate to ethylene polymer being from about 20:1 to about 1:20, and

c. about 0.1% to about 5%, based on the total of a and b, of a chromate selected from the group consisting of barium chromate, strontium chromate, and lead chromate,

and drying said solution or coating.

2. Metal coated with a dried composition comprising:

a. quaternary ammonium silicate of the formula $WM_2O.X(N_nR_p)_2O.YSiO_2ZH_2O$ where W is a number from 0 to 1, X is a number from 0.33 to 1.5, Y is a number from 2 to 10, Z is a number from 1 to 20, M is an alkali metal, R is an organic radical that forms an NR base selected from alkyl, alkanol, and heterocyclic groups, each independently selected, having from 1 to 20 carbon atoms, n is an integer from 1 to 10, and p is at least 4, and

b. ethylene polymer selected from the group consisting of copolymers, terpolymers and ionomers of ethylene with acrylic, methacrylic or crotonic acids or esters thereof or vinyl acetate, wherein the portion of ethylene polymer derived from ethylene is from about 60 to about 90 weight

percent, the weight ratio of SiO_2 derived from the quaternary ammonium silicate to ethylene polymer being from about 20:1 to about 1:20, and

c. about 0.1% to about 5%, based on the total of a and b, of a chromate selected from the group consisting of barium chromate, strontium chromate, and lead chromate.

4,507,361

LOW MOISTURE ABSORPTION BRISTLE OF NYLON AND POLYESTER

Ian C. Twilley, Chester; Garland L. Turner, Chesterfield; Peter R. Saunders, Richmond, all of Va., and John C. Haylock, Sparta, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 18, 1983, Ser. No. 514,711
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—373 **9 Claims**

1. A bristle material having a diameter of about 0.02 inches to about 0.09 inches and comprising a thermoplastic matrix and an abrasive filler material dispersed therein;

(a) said thermoplastic matrix comprising a mixture of about 70 to about 90 weight percent of a poly(ethylene terephthalate), having an intrinsic viscosity of at least about 0.60, based on the total thermoplastic weight, and about 10 to about 30 weight percent of polyamide having less than 35% of its end groups being amine groups; and

(b) said abrasive filler being present in an amount of about 2 to about 50 weight percent based on the total weight of the bristle.

4,507,362

RESTORATIVE SPRAY COATING FOR INSULATED COPPER CONDUCTORS

John T. Chapin, Norcross, and Raffaele A. Sabia, Atlanta, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 12, 1983, Ser. No. 541,056
Int. Cl.³ B32B *27/00, 9/00;* A21D *10/02;* H01B *7/00*
U.S. Cl. 428—383 **7 Claims**

1. A copper conductor having a cracked and/or damaged discontinuous primary insulation thereon characterized in that said discontinuous primary insulation has coated thereon a formulation comprising: (A) 2 to 45 weight percent phenolic resin; (B) 25 to 73 total weight percent of at least one oil selected from the group consisting of tung oil and dehydrated castor oil; (C) 25 to 75 weight percent solvent; and (D) 0.01 to 1.4 weight percent metallic catalysts and cocatalysts.

4,507,363

POLYOXYALKYLENEAMINE MODIFIED EPOXY COATINGS FOR CORRODED METAL SURFACES

Sui W. Chow, and Donald F. Smith, Jr., both of Bridgewater, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

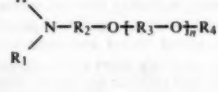
Filed May 3, 1984, Ser. No. 606,885
Int. Cl.³ B32B *15/08, 27/38*
U.S. Cl. 428—418 **15 Claims**

1. A process for coating a corroded metal surface comprising:

(1) applying to said surface a coating composition which comprises:

(a) a polyepoxide;

(b) a polyoxyalkyleneamine having the structural formula:



wherein:

n is ≥ 1;

R_1 is hydrogen, alkyl, aryl or aralkyl;

R_2 is alkylene;

R_3 is alkylene or arylene; and

R_4 is hydrogen or $-R_2-NHR_1$ wherein R_1 and R_2 are as defined previously; and

(c) a polyamine curing agent; and

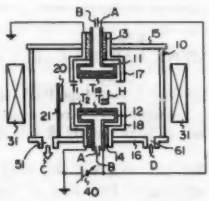
(2) curing said coating.

4,507,364

PERPENDICULAR MAGNETIC RECORDING MEDIUM

Sadao Kadokura, Hachioji; Takashi Tomie, Hino, and Masahiko Naoe, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 329,822, Dec. 11, 1981, Pat. No. 4,407,894. This application Jul. 14, 1983, Ser. No. 502,662
Claims priority, application Japan, Dec. 12, 1980, 55-174680
Int. Cl.³ H01F *10/02*
U.S. Cl. 428—457 **7 Claims**



1. A perpendicular magnetic recording medium formed on a base and comprising an hcp cobalt alloy layer having opposed major surfaces and comprising mainly cobalt and additionally chromium, said layer having a direction of easy magnetization in a direction normal to the base, characterized in that the cobalt alloy layer is composed of particles, with a boundary between the particles forming a non-columnar pattern extending between said surfaces of said cobalt alloy layer, as seen in a cross section of the layer observed with a scanning electron microscope, thereby providing said cobalt alloy layer with a homogeneous cross sectional structure.

4,507,365

CHEMICALLY MODIFIED ASPHALT PROTECTIVE COATING SOLUTION AND CONCRETE COATED WITH SAME

Loren D. Lower, Granville; Alfred Marzocchi, Newark; Frederick H. Ponn, III, Granville, and Michael G. Roberts, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 21, 1983, Ser. No. 553,618
Int. Cl.³ C08L *95/00;* B32B *11/04*
U.S. Cl. 428—489 **14 Claims**

1. An environmentally acceptable protective coating solution having good shelf life, said solution comprising a major amount of an asphaltic material and a minor, but effective solvating amount of a cyclohexane based solvent, said solvent being an admixture of at least about 75% (wt) cyclohexane, 15%–25% toluene and up to 10% n-hexane, said asphaltic composition being a blend of a minor amount of asphalt having a viscosity of less than about 120,000 cps (at 140° F.), and a major amount of the product produced by reacting a vinyl aromatic monomer, asphalt having a viscosity of less than 120,000 cps (at 140° F.), a rubbery polymer and an acrylamide.

14. A concrete surface having the coating solution of claim 1 thereon.

4,507,366

ROLLING MILL ROLL FOR A HOT TRAIN OF ROLLS

Jean C. Werquin, Ronchain, and Bernard Mercier, Sedan, both of France, assignors to Union Siderurgique du Nord et de l'est de la France, Paris, France

Continuation of Ser. No. 206,177, Nov. 12, 1980, abandoned. This application Apr. 29, 1983, Ser. No. 490,161

Claims priority, application France, Nov. 13, 1979, 79 27952

Int. Cl.[3] C22C *38/16*

U.S. Cl. 428—682 3 Claims

3. A method for hot rolling hot metal strip in a mill comprising a stand including rolls, said method comprising hot rolling the metal strip with composite metal rolls each of which rolls comprises a metal core and a radially outer cast chrome steel cylindrical working region, said cast chrome steel comprises between 0.9 and 1.3% of carbon and between 6 and 15% of chromium and wherein the ratio between respective contents of chromium and carbon is between 7 and 12 and the content of equivalent carbon is between 1.5 and 1.7%, said equivalent carbon being calculated as the sum of the content of carbon and the content of chromium with the content of chromium being given a coefficient of 0.05.

4,507,367

GALVANIC ELEMENT, PARTICULARLY A METAL-AIR CELL

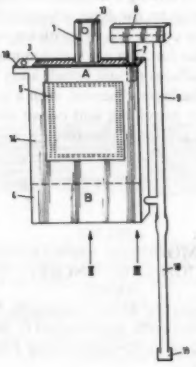
Jean Ruch; Detlef Katryniok, and Hugo Pack, all of Brilon, Fed. Rep. of Germany, assignors to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 399,058

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129248

Int. Cl.[3] H01M *4/00*

U.S. Cl. 429—27 12 Claims



1. In a galvanic element, particularly a metal-air cell, having a consumable metal electrode of flat shape which extends into a container adapted to contain electrolyte liquid, and a gas-diffusion electrode freely flushable by gas and arranged at a distance from a working surface of said metal electrode, the improvement wherein

said container being hermetically sealed with respect to gas produced during operation of the galvanic element by electrochemical conversion including means for collecting in said container the gas produced during operation of the galvanic element by electrochemical conversion, said means further for retaining said collecting gas in said closed container without venting said gas, said means further for building-up gas pressure of the related collecting gas in said container, and said means by the built-up gas pressure for operatively recirculating the electrolyte liquid through said container,

said means defining a hermetic gas collection space for the collecting, retaining and the building-up of the gas pressure of the retained collecting gas produced by the electrochemical conversion,

said collection space is formed in the upper part of said container, and the cell further comprises

a pipe system which extends outside of said container, is connected communicatingly with said upper part of said container and a lower part of said container and is operatively acted on as a function of the gas pressure for the transporting of the electrolyte liquid from the upper region of the container into the lower region of the container,

a cover hermetically closed the container in insulated manner and holds the metal electrode,

said pipe system further includes,

a discharge pipe connection projecting into the container through said cover and extending inside the container by an interior length of said discharge pipe connection, the latter being formed with an opening communicating with the upper part of the container,

said interior length of said discharge pipe connection to said opening limiting said gas collection space, said opening defining a lower limit of said gas collection space,

an overflow vessel leading to said discharge pipe connection,

a return pipe leading from said overflow vessel into the lower part of the container,

said pipe system includes a flexible siphon hose for the electrolyte liquid,

a venting and electrolyte outlet closure means at one end of the siphon hose for being opened and closed, respectively, and said siphon hose being connected at its other end to said return pipe.

4,507,368

BATTERY DEVICE

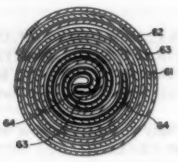
Hisashi Hashimoto, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 510,153, Jun. 30, 1983, abandoned, which is a continuation of Ser. No. 317,073, Nov. 2, 1981, abandoned. This application Jul. 23, 1984, Ser. No. 632,689

Claims priority, application Japan, Nov. 14, 1980, 55-163775[U]

Int. Cl.[3] H01M *2/10, 6/50*

U.S. Cl. 429—62 16 Claims



1. A battery device adapted to receive current from a source of charging current, said charging current source including means for varying said charging current, comprising:

an outer case comprised of a first case member and a second case member fixed together defining a space therebetween;

a secondary battery including first and second unit batteries disposed in said space, at least said second unit battery comprising a sealed nickel cadmium battery having a cathode sheet, an anode sheet and a separator sheet interposed between said cathode and anode sheets, said separator, cathode and anode sheets being spirally sound, said second unit battery further comprising oxygen penetra-

tion impeding means disposed in a central region of a cross-section of said spirally wound cathode, anode and separator sheets, for impeding oxygen penetration, whereby said second unit battery has a high rate of heat generation in a final stage of battery charging;

a charge-discharge circuit disposed in said space including first and second terminals for receiving said charging current for said secondary battery and for receiving discharging current from said secondary battery;

said charge-discharge circuit including a self-restoring breaker retained by said second case member and disposed adjacent said first unit battery, said breaker serving to detect current in said charge-discharge circuit and the environmental temperature in said case, having a switching characteristic responsive to said current and said environmental temperature, said switching characteristic being selected so that said breaker is cut off in at least one of the conditions where said current exceeds a predetermined value or where said environmental temperature exceeds a predetermined temperature lower than the temperature at which material of said outer case loses its configurational stability;

control terminal means for providing a control signal to said charging current source varying means for controlling said varying means; and

a thermostat disposed adjacent said second unit battery coupled to said secondary battery and coupled between said second and said control terminal means wherein a cut-off temperature of said thermostat corresponds to heat generated in a final stage of charging of said secondary battery and said cut-off temperature is lower than said self-restoring breaker cut-off temperature.

4,507,369

GLASS CERAMIC IONIC CONDUCTOR MATERIALS AND METHOD OF MAKING

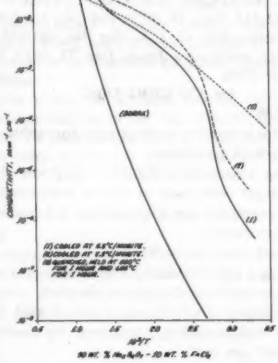
Stanislaw Badzioch, London, England, assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 439,020, Nov. 3, 1982, abandoned. This application Apr. 21, 1983, Ser. No. 487,499

Claims priority, application United Kingdom, Nov. 10, 1981, 8133825

Int. Cl.³ H01M *4/36, 6/14;* **C03B** *32/00;* **C03C** *3/22*

U.S. Cl. 429—104 **24 Claims**



1. A solid, crystalline glass ceramic derived from a glass composition consisting essentially of sodium or calcium borate and a metal halide selected from the chlorides, bromides and iodides.

4,507,370

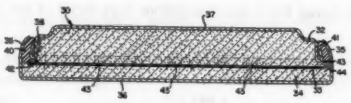
MINIATURE GALVANIC CELL CONSTRUCTION PROVIDING GAS CHANNELS BETWEEN ELECTRODE COMPARTMENTS

Lewis F. Urry, Columbia Station, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 392,711, Jun. 28, 1982, abandoned. This application Feb. 10, 1984, Ser. No. 579,055

Int. Cl.³ H01M *2/18*

U.S. Cl. 429—142 **10 Claims**



1. A sealed miniature galvanic cell comprising a housing having a container with a base, a sidewall and an open end, a cover disposed over the open end of the container and an electrically insulating sealing gasket compressively disposed between the container sidewall and the periphery of the cover, which housing contains a first electrode in electrical contact with the container, a second electrode in electrical contact with the cover, a separator interposed between the first and second electrodes and an electrolyte in ionic contact with the first and second electrodes, said sealing gasket comprising a base and a sidewall, which sidewall of the sealing gasket is disposed and compressed between the sidewall of said container and the periphery of said cover and which base comprises a radially inwardly extending flange, which flange is in contact with said separator; the improvement wherein the base of said sealing gasket defines a plurality of channels which extend past the periphery of the separator and which provide means for the exchange of gaseous products around said separator and between the first and second electrodes.

4,507,371

SOLID STATE CELL WHEREIN AN ANODE, SOLID ELECTROLYTE AND CATHODE EACH COMPRISE A CUBIC-CLOSE-PACKED FRAMEWORK STRUCTURE

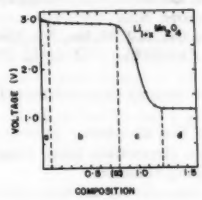
Michael M. Thackeray, Pretoria, South Africa, and John B. Goodenough, Oxford, England, assignors to South African Inventions Development Corporation, South Africa

Filed May 27, 1983, Ser. No. 498,859

Claims priority, application South Africa, Jun. 2, 1982, 82/3871

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—191 **23 Claims**



1. An electrochemical cell which comprises an anode and a cathode coupled together by a solid electrolyte, the anode and cathode being electronically conducting and the electrolyte being electronically insulating and each of said anode, cathode and electrolyte comprising a cubic-close-packed host framework structure having, as its basic structural unit, a unit of the formula $(B_2)X_4^{n-}$, where $(B_2)X_4^{n-}$ is the structural unit of a spinel, the X anions of said host framework structure being arranged in cubic-close-packed fashion to form a negatively

charged anion array, said host framework structure accommodating, within its interconnected interstitial spaces, electrochemically active cations M^+ capable of diffusion through the framework structure, wherein:

B is a metal cation;

X is an anion selected from the group VIa or group VIIa elements;

M is a cation selected from the group Ia or group Ib elements; and

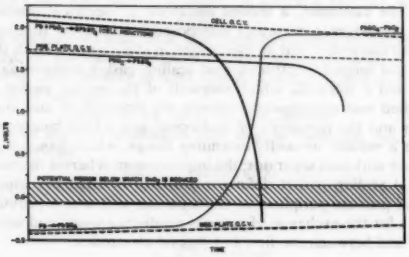
n− refers to the overall charge of the structural unit $(B_2)X_4$ of the host framework structure, the B cations of the anode being more electropositive than those of the cathode.

4,507,372

POSITIVE BATTERY PLATE

John R. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 25, 1983, Ser. No. 488,199
Int. Cl.³ H01M *4/56, 4/62*
U.S. Cl. 429—228 **13 Claims**



1. A positive paste for a lead-acid battery comprising:

a layer of positive active material containing a dispersion of tin oxide additive that is insoluble in sulfuric acid electrolyte, has a conductivity similar to the active material, and is thermodynamically stable during charge and discharge of said paste.

4,507,373

METHOD AND APPARATUS FOR UNIFORMLY CHARGING A SURFACE

George N. Tsilibes, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,602
Int. Cl.³ G03G *13/02, 13/22, 15/02*
U.S. Cl. 430—31 **15 Claims**

1. A method for forming an electrostatic latent image comprising

(a) moving in a first direction a member having a surface upon which an electrostatic latent image may be formed by image-bearing radiation;

(b) generating a corona current along the length of a line-charging element while the surface moves past the line-charging element to produce an electrostatic charge on the surface;

(c) generating a corona current from one or more point-charging elements as the charged surface moves past the point-charging elements to provide a more uniform charge over the surface than provided in step (b) above,

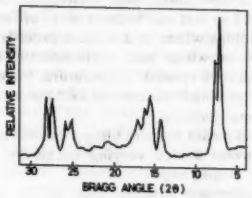
(d) exposing the charged surface to image-bearing radiation after it has been uniformly charged by the line and point-charging means to form the latent electrostatic image.

4,507,374

ELECTROPHOTOGRAPHIC RECORDING MEDIUM CONTAINING τ AND η METAL-FREE PHTHALOCYANINE

Atsushi Kakuta, Hitachiohta; Hiroyuki Oka, Hitachi; Shigeo Suzuki, Hitachi; Kotaro Araya, Hitachi; Yasuki Mori, Hitachi; Hirosada Morishita, Hitachi; Shigemasa Takano; Manabu Sawada, both of Tokyo, and Isao Kumano, Kawagoe, all of Japan, assignors to Hitachi, Ltd. and Toyo Ink Manufacturing Co., Ltd., both of Tokyo, Japan

Filed Apr. 15, 1983, Ser. No. 485,400
Claims priority, application Japan, Apr. 20, 1982, 57-66963
Int. Cl.³ G03G *5/06;* C09B *47/04*
U.S. Cl. 430—56 **15 Claims**



1. A recording medium for electrophotography comprising a thin layer containing an effective amount of a metal-free phthalocyanine selected from the group consisting of τ, τ′, η, η′ form metal-free phthalocyanine and mixtures thereof, and an electroconductive substrate supporting the layer.

4,507,375

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND PROCESS FOR PRODUCTION THEREOF

Yutaka Hirai, Tokyo; Toshiyuki Komatsu, Kawasaki; Katsumi Nakagawa, Tokyo; Teruo Misumi, Toride, and Tadaji Fukuda, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 214,045, Dec. 8, 1980, , which is a division of Ser. No. 971,114, Dec. 19, 1978, Pat. No. 4,265,991. This application Feb. 17, 1984, Ser. No. 581,435
Claims priority, application Japan, Dec. 22, 1977, 52-154629; Jan. 23, 1978, 53-5958
Int. Cl.³ G03G *5/082*
U.S. Cl. 430—128 **17 Claims**

1. A process for preparing an electrophotographic photosensitive member which comprises:

(a) evacuating a pressure-reducible deposition chamber in which a target composed of silicon and a substrate for electrophotography are disposed in fixed positions, to reduce the pressure,

(b) heating said substrate to 50°–350° C.,

(c) introducing a gas containing a hydrogen atom as a constituent atom into said deposition chamber,

(d) causing electric discharge in space of said deposition chamber in which said target is present, by electric energy to ionize said gas, and

(e) depositing amorphous silicon on said substrate at a deposition rate of 0.5–100 angstroms/sec. by utilizing said electric discharge while continuing the electric discharge for a period of time sufficient to form an amorphous silicon photoconductive layer of a predetermined thickness.

4,507,376

ELECTROPHOTOGRAPHIC TONER COMPOSITION

Muneharu Makita, Takatsuki; Osamu Oseto, Suita, and Toshiaki Munemitsu, Takatsuki, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1983, Ser. No. 514,020
Claims priority, application Japan, Jul. 23, 1982, 57-129280
Int. Cl.[3] G03G 9/08
U.S. Cl. 430—109 6 Claims

1. A toner composition for electrophotography comprising a resin binder and a colorant, said resin binder being a polymeric rosin compound having a softening point of 50° to 190° C., a glass transition temperature of 10° to 170° C. and a molecular weight of 2,000 to 40,000 and being prepared by the reaction of:

(a) a glycidyl ester of rosin,

(b) a dicarboxylic acid or a dicarboxylic acid anhydride, and

(c) at least one crosslinking agent selected from the group consisting of a polyfunctional epoxy compound, a polybasic acid having a valency of not less than 3 and its anhydride, and a polyhydric alcohol having a valency of not less than 3.

4,507,377

SELF-FIXING LIQUID ELECTROGRAPHIC DEVELOPERS

Peter S. Alexandrovich, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US82/00435, § 371 Date Nov. 19, 1982, § 102(e) Date Nov. 19, 1982
PCT Filed Apr. 8, 1972, Ser. No. 448,885
Int. Cl.[3] G03G 9/12
U.S. Cl. 430—115 15 Claims

1. A liquid electrostatic image developer composition comprising an electrically insulating organic carrier liquid containing, as a dispersed constituent, a plurality of toner particles comprising a compatible blend of at least one polyester resin and at least one polyester plasticizer, characterized in that the plasticizer has a glass transition temperature below −40° C. and is substantially free from curable groups and is substantially insoluble in the carrier liquid.

4,507,378

METHOD FOR THE PRODUCTION OF TONER FOR ELECTROPHOTOGRAPHY AND THE TONER PRODUCED THEREBY

Tsuneo Wada; Kiyoshi Tamaki; Hideki Murata; Sadatugu Terada, all of Hino, and Hiroyuki Takagiwa, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 470,235, Feb. 28, 1983, abandoned, which is a continuation of Ser. No. 244,593, Mar. 17, 1981, abandoned. This application Dec. 6, 1983, Ser. No. 558,994
Claims priority, application Japan, Mar. 17, 1980, 55-32673
Int. Cl.[3] G03G 9/08, 9/14
U.S. Cl. 430—137 10 Claims

1. A method for producing toner for electrophotography comprising

(A) polymerizing a monomer in the form of aqueous suspension in an aqueous dispersion medium containing (a) said monomer, (b) a dispersant selected from a group consisting of an orthophosphate, a pyrophosphate and a polyphosphate, (c) an anionic surfactant, and (d) a coloring agent,

(B) treating the polymerization product with diluted acid solution and

(C) rinsing said polymerization product with water whereby said dispersant is removed from said polymerization product.

4,507,379

METHOD FOR CONVERTING RADIOGRAPHIC IMAGES

Hisanori Tsuchino; Manami Teshima; Hiroshi Takeuchi, and Fumio Shimada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,318
Claims priority, application Japan, Aug. 25, 1982, 57-148285
Int. Cl.[3] G03C 5/04
U.S. Cl. 430—139 15 Claims

1. A method for converting radiographic images comprising steps of

(1) making a radiation passed through an object absorbed into a stimulable phosphor,

(2) stimulating the phosphor by a stimulating ray to release a radiation energy stored in the phosphor as fluorescence, and

(3) detecting the fluorescence to form an image, wherein the phosphor is a phosphate-type phosphor of Formula (I) or (II) and the stimulating ray is at least one of a visible ray of not less than 500 nm and a infrared ray.

Formula (I)

$$xM_3(PO_4)_2 \cdot NX_2 : yA$$

Formula (II)

$$M_3(PO_4)_2 : yA$$

wherein M and N selected from at least one of Mg, Ca, Sr, Ba, Zn and Cd; X is at least one of F, Cl, Br and I; A is at least one of Eu, Tb, Ce, Tm, Dy, Pr, Ho, Nd, Yb, Er, Sb, Tl, Mn and Sn; and x and y are values satisfying the conditions of $0 < x \leqq 6$ and $0 \leqq y \leqq 1$, respectively.

4,507,380

HEAT-DEVELOPABLE COLOR PHOTOGRAPHIC MATERIAL CONTAINING DYE RELEASING COUPLERS

Hideki Naito; Hiroshi Hara; Kozo Sato, and Yoshiharu Yabuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1982, Ser. No. 389,341
Claims priority, application Japan, Jun. 17, 1981, 56/93533
The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.
Int. Cl.[3] G03C 5/54, 1/40
U.S. Cl. 430—203 33 Claims

1. A heat-developable color photographic material comprising a support having thereon a layer containing at least a photographic silver halide and the photographic material containing an organic silver salt oxidizing agent, a reducing agent, a binder and a dye releasing compound which releases a diffusible dye upon heat development wherein the dye releasing compound is represented by the following general formula:

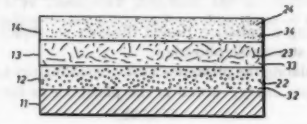
C—L—D

where C represents a moiety capable of bonding to an oxidized product which is formed by a reaction between a reducing agent and an organic silver salt oxidizing agent; D represents a dye portion for forming an image which does not contain a carboxylic acid group or a sulfonic acid group; and L represents a connection group between C and D and the bond between C and L is cleaved upon the reaction of C with the oxidized product of the reducing agent; and the support is capable of receiving the released dye or the support has a layer composed of an organic high molecular weight compound which is capable of receiving the released dye.

4,507,381
NON-AQUEOUS SILVER HALIDE DIFFUSION IMAGING SYSTEM

Paul C. Adair; Homer G. Duda; Amy L. Burkholder; Richard F. Wright, all of Chillicothe, and Mary M. Stanley, Waverly, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 448,633, Dec. 10, 1982, Pat. No. 4,476,213.
This application Apr. 10, 1984, Ser. No. 598,903
Int. Cl.³ G03C 5/54, 5/30
U.S. Cl. 430—246 4 Claims



1. A method of diffusion transfer imaging, comprising:
preparing a self-contained diffusion transfer sheet which includes:
a substrate,
a silver halide emulsion layer which includes a non-ionic continuous phase,
a nucleating layer, and
means for separating said silver halide emulsion layer and said nucleating layer, said means being permeable to a non-aqueous activating medium, acting as a water barrier and including an opacifying agent, said means being interposed between said silver halide emulsion layer and said nucleating layer,
exposing the diffusion transfer sheet to actinic radiation; and
supplying at least one non-aqueous activating medium containing a polar, non-aqueous solvent to the sheet; said sheet and/or one of said non-aqueous activating medium containing a developing agent, a silver transport agent and a base, provided that when both said base and said developer are present in said sheet they are present on opposite sides of said water barrier separating means and further provided that when said silver transport agent is present in said sheet it it present in said nucleating layer.

4,507,382
WATER DEVELOPABLE POSITIVE ACTING LITHOGRAPHIC PRINTING PLATE

Alan D. Rousseau, Stillwater; Elsie A. Fohrenkamm, St. Paul, and William L. Kausch, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,808
Int. Cl.³ G03F 7/10
U.S. Cl. 430—275 11 Claims

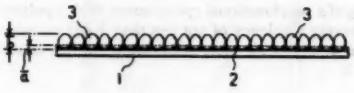
1. A positive-acting lithographic plate comprising a substrate, an oleophilic layer bonded to said substrate, and a water soluble photosensitive layer adhered to said oleophilic layer, said water soluble photosensitive layer when imagewise exposed to radiation, reacting in the exposed areas to provide an insoluble, water-receptive, ink-repellent surface corresponding with the radiation struck areas while remaining soluble and readily removable in the unexposed areas, said water soluble photosensitive layer being formed from a composition comprising
(a) an ethylenically unsaturated dextrin oligomer having a degree of substitution of about 0.20 to about 0.45,
(b) at least one hydroxyfunctional acrylamide monomer,
(c) inorganic particulate material, and
(d) a photoinitiation system, wherein the composite formed by the substrate and the overlying oleophilic layer exhibits a surface roughness as measured over the surface of the oleophilic layer corresponding to an arithmetic average roughness of about 0.64 to about 1.00 micrometer.

2. The plate of claim 1 wherein the substrate is selected from the group consisting of metals and synthetic polymeric materials.

4,507,383
MATERIAL FOR A PLANOGRAPHIC PLATE AND A METHOD OF PREPARING SUCH MATERIAL

Hirobumi Tsuruta, Tokyo, and Kiichi Kondo, Ageo, both of Japan, assignors to Sankyo Rikagaku Kabushiki Kaisha, Tokyo and Daishin Kagaku Kogyo Kabushiki Kaisha, Saitama, both of, Japan

Continuation-in-part of Ser. No. 427,328, Sep. 29, 1982, abandoned. This application Nov. 2, 1983, Ser. No. 547,828
Claims priority, application Japan, Oct. 12, 1981, 56-161060; Jan. 21, 1982, 57-008207
Int. Cl.³ G03C 1/94, 1/76; G03F 7/02
U.S. Cl. 430—275 12 Claims



1. A material for a planographic plate comprising a substrate, a thin layer of a water-resistant adhesive on said substrate, a layer of finely divided solid nonmetallic particles adhered to said thin layer of water-resistant adhesive, said finely divided solid nonmetallic particles being substantially evenly distributed on said thin layer of adhesive, the ratio of the thickness of said thin adhesive layer to the average diameter of said finely divided solid nonmetallic particles being in the range of from 0.2 to 0.4, said finely divided solid nonmetallic particles having hydrophilic surfaces treated with a solution comprising a weak acid, and a coating of photosensitive material on said layer of finely divided solid nonmetallic particles, said photosensitive material comprising a photopolymer as a main ingredient.

3. A planographic-plate material according to claim 1, hwerein said substrate is a thin metallic sheet.

7. A material for a planographic plate comprising a substrate, a thin layer of a water-resistant adhesive on said substrate, a layer of finely divided solid metallic particles adhered to said thin layer of water-resistant adhesive, said finely divided solid metallic particles being substantially evenly distributed on said thin layer of adhesive, the ratio of the thickness of said thin adhesive layer to the average diameter of said finely divided solid metallic particles being in the range of 0.2 to 0.4 such that said adhesive does not emerge from the layer of finely divided metallic particles, said finely divided solid metallic particles having hydrophilic surfaces treated with a solution comprising a weak acid, and a coating of photosensitive material on said layer of finely divided solid metallic particles, said photosensitive material comprising a photopolymer as a main ingredient.

9. A planographic-plate material according to claim 7, wherein said substrate is a thin metallic sheet.

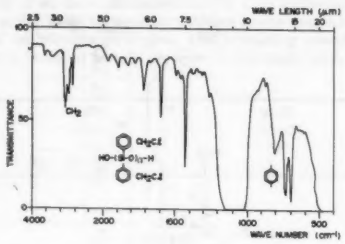
4,507,384
PATTERN FORMING MATERIAL AND METHOD FOR FORMING PATTERN THEREWITH

Masao Morita; Akinobu Tanaka; Saburo Imamura, all of Mito; Toshiaki Tamamura, Katsuta, and Osamu Kogure, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

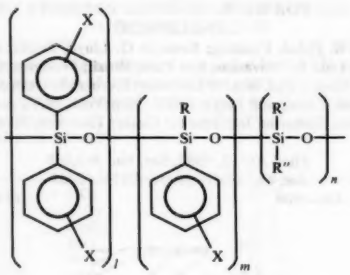
Filed Feb. 15, 1984, Ser. No. 580,468
Claims priority, application Japan, Apr. 18, 1983, 58-66892; Apr. 18, 1983, 58-66893; Jul. 11, 1983, 58-124766
Int. Cl.³ G03C 5/00
U.S. Cl. 430—311 6 Claims

1. A method for forming a pattern, comprising the steps of

forming a high-energy radiation-sensitive material film on a substrate; selectively irradiating a surface of the high-energy radiation-sensitive material film with a high-energy beam; and



removing by developing a non-irradiated portion of the high-energy radiation-sensitive material film with a developing solvent, wherein the high-energy radiation-sensitive material film comprises a siloxane polymer having a general formula:



[wherein R, R′ and R″ are the same or different and are respectively one member selected from the group consisting of hydrogen, an alkyl group and a phenyl group; X is one member selected from the group consisting of fluorine, chlorine, bromine, iodine and a $—CH_2Y$ group (wherein Y is one member selected from chlorine, fluorine, bromine, iodine, an acryloyloxy group, a methacryloyloxy group, and a cinnamoyloxy group); and l, m and n are respectively 0 or a positive integer, l and m not being simultaneously 0].

4,507,385

ACRYLONITRILE COPOLYMERS AS PROTECTIVE OVERCOATS IN PHOTOGRAPHIC ELEMENTS

David J. Steklenski, Rochester; Donald A. Upson, Webster, and Howard M. Low, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 25, 1983, Ser. No. 478,937
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—523 **7 Claims**

1. A photographic element comprising a support, at least one radiation sensitive layer and an overcoat layer comprising a aqueous latex polymer characterized in that the polymer comprises random recurring units having the structure:

$$—A)_x, —B)_y \text{ and } —C)_z;$$

wherein

A represents a polymerized acrylonitrile monomer;

B represents a polymerized hydrophobic ethylenically unsaturated monomer;

C represents a polymerized ionically charged vinyl monomer;

x is from 10 to 90 weight percent;

y is from 5 to 40 weight percent except when B is a vinyl halide monomer, y is 10 to 89.9 weight percent; and

z is from 0.1 to 10 weight percent.

4,507,386

SILVER HALIDE PHOTOGRAPHIC EMULSION

Syoji Matsuzaka, Hino; Makoto Kajiwara; Masanobu Miyoshi, both of Odawara, and Kiyoshi Yamashita, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,020
Claims priority, application Japan, Sep. 13, 1982, 57-160699
Int. Cl.³ G03C *7/26*
U.S. Cl. 430—549 **17 Claims**

1. A silver halide photographic emulsion containing a coupler for photography, comprising silver halide particles in said emulsion consisting essentially of 2 mole % or less of silver iodide, 50 to 97 mole % of silver bromide and 1 to 50 mole % of silver chloride, and said particles are core/shell type silver halide particles containing a higher content of said 50 to 97 mole % silver bromide in the surface layers of said particles than in the inner portions thereof, the surface layer of said particles containing 70 to 100 mole % of silver bromide and the inner portion containing 40 to 70 mole % of silver bromide.

4,507,387

METHOD OF STORING RED BLOOD CELLS WHICH MINIMIZES BOTH RED BLOOD CELL HEMOLYSIS AND EXPOSURE TO BLOOD EXTRACTABLE PLASTICIZERS

Henry M. Gajewski, Winnetka; Barry H. Vernick, McHenry; Paul E. Measells, Libertyville, and Jan W. Garber, McHenry, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 202,515, Oct. 31, 1980, abandoned. This application Mar. 9, 1983, Ser. No. 471,745
Int. Cl.³ A01N *1/02*
U.S. Cl. 435—2 **9 Claims**

1. A method of storing a quantity of red blood cells at 4° C., said method comprising the steps of

fabricating a polyvinyl chloride material having a desired degree of flexibility by using a combination of first and second plasticizers, the first plasticizer being present in an amount of from 5 to 30 percent by weight of the material and consisting of a fatty ester containing at least three ester linkages comprising fatty hydrocarbon groups of at least four carbon atoms on a hydrocarbon chain, the second plasticizer being present in an amount of from 10 to 25 percent by weight of the material and being selected from the group consisting of fatty esters containing at least two ester linkages comprising fatty hydrocarbon groups of 4 to 12 carbon atoms each on a hydrocarbon chain and phosphate esters containing at least two ester linkages comprising fatty hydrocarbon groups of 4 to 12 carbon atoms,

forming a bag from the flexible material,

conveying the quantity of red blood cells into the bag, and

storing the quantity of red blood cells within the bag at 4° C. for the desired storage interval, and

permitting the plasticizers to leach from the bag material into the quantity of red blood cells during the storage interval, the second plasticizer, upon leaching, being capable of suppressing the formation of plasma hemoglobin within the red blood cells, the plasticizers being present, in combination, within the quantity of red blood cells in amounts which, at the end of the storage interval, are significantly less than had the second plasticizer been used alone in greater weight percentages to achieve the desired degree of flexibility for the bag material but which, dut to the leaching of the second plasticizer, albeit in lesser amounts, are still sufficient to suppress the amount of plasma hemoglobin in the red blood cells.

4,507,388

UREA DETERMINATION METHOD

Alessandro Tabacco, Scanzorosciate, and Franco Meiattini, Siena, both of Italy, assignors to Sclavo, Siena, Italy

Continuation of Ser. No. 74,743, Sep. 12, 1979, abandoned. This application Jul. 9, 1981, Ser. No. 281,722
Claims priority, application Italy, Sep. 15, 1978, 27718 A/78
Int. Cl.³ C12Q 1/58
U.S. Cl. 435—12 8 Claims

1. A method for the enzymic-colorimetric determination of urea comprising steps of:

(a) admixing the sample to be tested with a reagent containing an admixture of urease, a phosphate buffer, a salicylate and an oxychlorination reaction catalyst selected from the group consisting of a nitroprusside and aquopentacyanoferrate.

(b) incubating the admixture of step (a), and

(c) adding a hypochlorite, and additionally incubating, and thereafter photometrically determining the amount of urea present.

4,507,389

DETERMINATION OF COLLAGENASE BY REACTING WITH PEPTIDE SUBSTRATES

Harold I. Weingarten, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 450,318, Dec. 16, 1982, Pat. No. 4,466,919. This application Mar. 16, 1984, Ser. No. 590,395
Int. Cl.³ C12Q 3/00, 1/38; C12N 9/50
U.S. Cl. 435—23 4 Claims

1. A method for the determination of collagenase in a biological sample comprising reacting an aqueous solution of said sample with a peptide substrate selected from the group consisting of

R_1-Pro-Leu-Gly-Leu-Leu-Gly-R_2

and

R_1-Pro-Leu-Gly-Leu-Ala-Gly-R_2,

wherein

R_1=H or N-protecting group, and

R_2=terminal amide, carboxyl or ester group, and measuring the time of cleavage product formation.

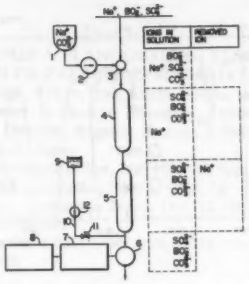
4,507,390

CHROMATOGRAPHIC ANALYSIS FOR ANIONS INVOLVING COMPLEXING ANIONS WITH A POLYHYDRIC ALCOHOL

Susumu Horiuchi; Taiji Hiraoka, and Toru Saito, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,620
Claims priority, application Japan, Mar. 13, 1980, 55-32535; Mar. 26, 1980, 55-39203
Int. Cl.³ G01N 31/08, 27/06
U.S. Cl. 436—161 19 Claims

1. A process for analyzing anions, which comprises feeding a liquid containing a plurality of free acids as anions to a first column filled with anion exchange resin, thereby separating the free acids by the anion exchange resin, then feeding an alkaline eluting solution to the first column, thereby releasing the free acids from the first column, introducing the liquid containing the free acids into a second column filled with cation exchange resin, mixing a liquid containing the free acids



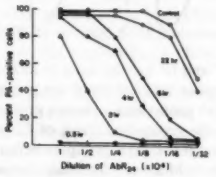
flowing out of the second column with a polyhydric alcohol, and measuring the activity as acid of the mixed liquid.

4,507,391

METHOD FOR DETECTING THE PRESENCE OF G_{D3} GANGLIOSIDE

Clifford S. Pukel, Flushing; Kenneth O. Lloyd, Bronx, both of N.Y.; Luiz R. Travassos, Sao Palo, Brazil; Wolfgang G. Dippold, Mainz, Fed. Rep. of Germany; Herbert F. Oettgen, New Canaan, Conn., and Lloyd J. Old, New York, N.Y., assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Apr. 2, 1982, Ser. No. 365,065
Int. Cl.³ G01N 33/54; C12N 15/00
U.S. Cl. 436—504 12 Claims



9. Method for the diagnosis of disorders characterized by elevated ganglioside levels in humans which comprises contacting a human test specimen with a suspected elevated ganglioside level with a G_{D3} specific monoclonal antibody derived by immunization with SK-MEL-28 (deposited as ATCC HTB72) human melanoma immunogen and observing the presence or absence of an immune complex formation.

4,507,392

TRANSPARENT GLASS-CERAMICS OF HIGH NEGATIVE EXPANSION FOR USE AS DECORATIVE GLAZES

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,625
Int. Cl.³ C03C 3/22
U.S. Cl. 501—4 2 Claims

1. A transparent glass-ceramic material containing beta-quartz solid solution as the predominant crystal phase especially suitable for application as a decorative glaze to glass, glass-ceramic, and ceramic bodies exhibiting an average coefficient of thermal expansion (0°–300° C.) of less than 15×10^{-7}/°C., said glass-ceramic material demonstrating an average coefficient of thermal expansion (25°–100° C.) of less than -15×10^{-7}/°C., excellent resistance to attack by acids

and bases as evidenced by essentially no change of gloss and a weight loss of no more than about 0.02% after immersion for 24 hours at 96° C. in a aqueous solution containing 10% by weight citric acid and essentially no change of gloss and a weight loss of no more than about 0.02% after immersion for 24 hours at 96° C. in an aqueous solution containing 0.3% by weight of an alkaline detergent, and consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	50–67
Al_2O_3	22–32
Li_2O	4.5–7
TiO_2 and/or ZrO_2	4.5–8

4,507,393
HIGHLY PREFRACTIVE, LOW DISPERSION OPTICAL GLASS SUITABLE FOR MULTIFOCAL CORRECTIVE LENSES

Reinhard Kassner, Alfeld, Fed. Rep. of Germany; Karl-Heinz Mader, Clarks Summit, and Lee M. Cook, West Pittston, both of Pa., assignors to Schott Glass Technologies, Inc., Duryea, Pa.

Filed Aug. 11, 1983, Ser. No. 522,279
Int. Cl.[3] C03C *3/08, 3/10*
U.S. Cl. 501—75 **12 Claims**

1. A glass having a refractive index of at least 1.730, an Abbe number of at least 33, a density of not more than 4.45 g/cm^3, and a coefficient of thermal expansion of not more than 83 and not less than 77×10^{-7}/°C. over 20°–300° C., and consisting essentially of, in wt.%:

SiO_2	23–32
B_2O_3	4–7
Al_2O_3	0.5–3
BaO	23–30
PbO	15–30
TiO_2	0.5–10
La_2O_3	5–20
Nb_2O_5	0–1.

4,507,394
HIGH ELECTRIC RESISTANT ZIRCONIA AND/OR HAFNIA CERAMICS

Syunzo Mase, Aichi, and Shigeo Soejima, Nagoya, both of Japan, assignors to Ngk Insulators, Ltd., Japan

Filed Dec. 8, 1983, Ser. No. 559,269
Claims priority, application United Kingdom, Dec. 24, 1982, 8236813; Apr. 25, 1983, 8311146
Int. Cl.[3] C04B *35/00*
U.S. Cl. 501—94 **3 Claims**

1. Ceramics which consist essentially of 5–30 mol% of at least one component of Group A consisting of $YO_{1.5}$, $ScO_{1.5}$, $SmO_{1.5}$, $EuO_{1.5}$, $GdO_{1.5}$, $TbO_{1.5}$, $DyO_{1.5}$, $HoO_{1.5}$, $ErO_{1.5}$, $TmO_{1.5}$, $YbO_{1.5}$, $LuO_{1.5}$, CaO and MgO, 5–40 mol% of at least one component of Group B consisting of $NbO_{2.5}$ and $TaO_{2.5}$ and 30–90 mol% of at least one component of Group C consisting of ZrO_2 and HfO_2.

4,507,395
CHROMIA-MAGNESIA RAMMING CEMENT

Cecil M. Jones, Worcester, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jun. 13, 1983, Ser. No. 503,998
Int. Cl.[3] C04B *35/04, 35/42*
U.S. Cl. 501—115 **11 Claims**

1. A retractory ramming cement consisting essentially of grains of fused crushed chromia-magnesia spinel bonded with an in situ fired bond resulting from heating said grains together with an intimate mixture of clay, fine chromia, fine calcined magnesia and a phosphate binder, and wherein the ratio of fine chromia to fine calcined magnesia is about 3 to about 5 parts by weight of chromia to 1 part by weight of calcined magnesia.

4,507,396
SOLID BODY PREPARATION AND FORMATION BY AGGLOMERATION IN AN IMMISCIBLE SOLVENT

Donald A. Hickson, Benicia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 18, 1983, Ser. No. 524,197
Int. Cl.[3] B01J *29/06, 37/00*
U.S. Cl. 502—8 **16 Claims**

1. The process for producing a plastic agglomerate comprising inorganic materials suitable for further processing to form strong solid catalytic or absorptive refractory bodies which comprises the steps of:

(a) dispersing with mixing a portion of said inorganic materials as surface hydrated micron-sized particles in a water-immiscible solvent thereby forming a thoroughly separated dispersion;

(b) gradually and controllably adding to said dispersion an aqueous phase in the presence of colloidal sized inorganic particles while continuing said mixing until a hydrous plastic agglomerate forms comprising said aqueous phase and said micron-sized and colloidal particles; and

(c) separating said hydrous agglomerate from said water-immiscible solvent.

3. The process of claim 1 wherein the weight ratio of micron-sized particles to colloidal sized particles is from 51:49 to 90:10.

7. The process of claim 3 wherein the micron-sized particles are zeolite and the colloidal particles are alumina.

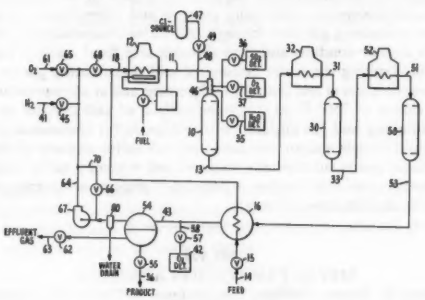
9. The process of claim 3 wherein the micron-sized particles are zeolite and the colloidal particles are titania.

13. The process of claim 3 wherein the micron-sized particles are zeolite and the colloidal particles are clay.

4,507,397
SEMI-CONTINUOUS REGENERATION OF SULFUR-CONTAMINATED CATALYTIC CONVERSION SYSTEMS

Waldeen C. Buss, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 28, 1983, Ser. No. 517,913
Int. Cl.[3] B01J *23/96, 21/20;* **C10G** *35/08*
U.S. Cl. 502—38 **25 Claims**



1. In a process of oxidatively regenerating in situ a hydrocarbon conversion catalyst, which catalyst is sensitive to reactive sulfur compounds and which has become contaminated with carbonaceous deposits, in a fixed catalyst bed conversion system having sulfur-contaminated vessels and/or conduits in the flow path upstream from said catalyst bed, which process includes passing a regenerating oxygen-containing gas through said sulfur-contaminated vessels and/or conduits and then

through said catalyst to burn off said carbonaceous deposits under controlled conditions, the improvement which comprises passing said regenerating oxygen-containing gas in the flow path first through said sulfur-contaminated vessels and/or conduits and then through said fixed catalyst bed while limiting the water content of said regenerating gas to a concentration of not more than 0.1 mol percent throughout said flow path and oxidizing the sulfur in said contaminated vessels and/or conduits at a temperature in the range of 750°-1100° F. so that the evolved sulfur oxides flowing through said catalyst are in the absence of sufficient water which would promote reaction of sulfur oxides with said catalyst, and continuing the flow of said gas so limited as specified in water content until substantially all the oxidizable sulfur contaminants have been removed from the conversion system.

22. In a process of oxidatively regenerating in situ a hydrocarbon conversion catalyst, which catalyst is sensitive to reactive sulfur compounds and which has become contaminated with carbonaceous deposits, in a fixed catalyst bed conversion system having sulfur-contaminated vessels and/or conduits in the flow path upstream from said catalyst bed, the improvement which comprises passing a regenerating oxygen-containing gas in the flow path first through said sulfur-contaminated vessels and/or conduits and then through said fixed catalyst bed while limiting the water content of said regenerating gas to a concentration of not more than 0.1 mol percent throughout said flow path and oxidizing the sulfur contaminants in said vessels and/or conduits at a temperature in the range of 750°-1100° F. so that the evolved sulfur oxides flowing through said fixed bed catalyst are in the absence of sufficient water which would promote reaction of sulfur oxides with said catalyst, continuing the flow of said gas so limited in water content until substantially all the oxidizable sulfur contaminants have been removed from the conversion system, and thereafter oxidizing the carbonaceous deposits on said catalyst.

25. In a process of oxidatively regenerating in situ a hydrocarbon conversion catalyst which catalyst is sensitive to reactive sulfur compounds and which has become contaminated with carbonaceous deposits, in a fixed catalyst bed conversion system having sulfur-contaminated vessels and/or conduits in the flow path upstream from said catalyst bed and wherein oxygen-containing gas is circulated through said catalyst having an alumina base and including a platinum component and a rhenium component and said gas oxidizes the carbonaceous deposits on said catalyst at a temperature of about 750° F. and after the carbon content of said catalyst has been substantially reduced said gas is circulated through said catalyst bed at a temperature of above 900° F. to facilitate redispersion of said platinum component over the alumina surface of said catalyst, the improvement comprising passing said regenerating oxygen-containing gas first through said sulfur-contaminated vessels and/or conduits and then through said fixed catalyst bed while limiting the water content of said regenerating gas to a concentration at less than 0.1 mol percent and at a temperature in excess of 750° F. at the inner surface of said conduit and continuing said gas circulation to reduce sulfur contamination of said vessels and/or conduits until the sulfur content of the effluent gas is substantially reduced and whereby sulfur contamination of said catalyst is prevented prior to said carbonaceous deposit removal step.

4,507,398

METAL PASSIVATION ADDITIVE

Ernest B. Boston, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 599,840, Apr. 13, 1984,. This application Aug. 3, 1984, Ser. No. 637,360

Int. Cl.[3] **C10G** *11/05;* **C07F** *9/90;* **B01J** *23/18*

U.S. Cl. 502—62 **18 Claims**

11. A catalyst composition comprising an active hydrocarbon cracking catalyst treated with an antimony compound selected from at least one of the formula;

$$Sb[SR(OH)_n]_3$$

where the R group is a hydrocarbyl having from about 1 to about 18 carbon atoms and n is 1, 2 or 3.

4,507,399

CADMIUM-CONTAINING CATALYST

Jeffrey T. Miller, and Thomas D. Nevitt, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 28, 1983, Ser. No. 536,673

Int. Cl.[3] **B01J** *21/16, 23/06*

U.S. Cl. 502—63 **7 Claims**

1. A catalyst composition comprising a cadmium component and a support material comprising at least one of a crystalline borosilicate molecular sieve and a pillared smectite or vermiculite clay, wherein the cadmium component is in the form of the elemental metal, its oxide or salt or a combination thereof, and wherein the cadmium component is present at a concentration level in the range of from about 0.1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst.

3. The catalyst composition of claim **1** wherein the cadmium component is present at a concentration level in the range of from about 1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst.

6. The catalyst composition of claim **1** wherein the support comprises from about 20 to about 95 weight percent of an amorphous refractory inorganic oxide and from about 5 to about 80 weight percent of the crystalline borosilicate molecular sieve or pillared smectite or vermiculite clay.

4,507,400

CADMIUM- AND THORIUM-CONTAINING CATALYST

Jeffrey T. Miller, and Thomas D. Nevitt, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 28, 1983, Ser. No. 536,711

Int. Cl.[3] **B01J** *21/16, 23/06, 29/04*

U.S. Cl. 502—63 **12 Claims**

1. A catalyst composition comprising a cadmium component, a thorium component and a support material having acidic properties, wherein each of the cadmium component and the thorium component is in the form of the elemental metal, its oxide or salt or a combination thereof, wherein the cadmium component is present at a concentration level in the range of from about 0.1 to about 20 weight percent, calculated as cadmium oxide and based on the weight of the catalyst, and wherein the thorium component is present at a concentration in the range of from about 1 to about 25 weight percent, calculated as thorium oxide and based on the weight of the catalyst.

5. The catalyst composition of claim **1** wherein the support comprises a refractory inorganic oxide, a molecular sieve, a pillared smectite or vermiculite clay or a combination thereof.

6. The catalyst composition of claim **5** wherein the refractory inorganic oxide comprises alumina, zirconia, titania, an oxide of a metal of the lanthanide series, a combination thereof, or a combination thereof with silica or magnesia.

7. The catalyst composition of claim **5** wherein the molecular sieve comprises a crystalline aluminosilicate, crystalline borosilicate, or mixture thereof, in the unexchanged or cation-exchanged form.

4,507,401

INTERMETALLIC CATALYST PREPARATION

Lawrence H. Dubois, Berkeley Heights, and Ralph G. Nuzzo, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 1, 1983, Ser. No. 481,160

Int. Cl.[3] **B01J** *37/02, 23/62, 23/82*

U.S. Cl. 502—242 **11 Claims**

1. A process for making a catalyst comprising the steps of: (a) forming a Group VIII-containing composition on a support and

(b) contacting the Group VIII-containing support with a metal hydride or organometallic compound at a temperature sufficient to form an intermetallic compound wherein the metal hydride or organometallic compound contains at least one metal atom selected from the group consisting essentially of silicon, germanium, aluminum, boron, gallium, indium, and tin.

4,507,402

CATALYST FOR DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, c/o French, Hughes and Doescher, P.O. Box 2443, Bartlesville, Okla. 74005

Division of Ser. No. 538,068, Sep. 30, 1983, Pat. No. 4,457,835. This application Mar. 27, 1984, Ser. No. 593,742

Int. Cl.³ B01J *27/18*

U.S. Cl. 502—208 **5 Claims**

1. A catalyst composition comprising a coprecipitated mixture of zirconium phosphate and copper phosphate.

4,507,403

PROCESS FOR PREPARATION OF METHANOL

Kazuo Asakawa, Niigata, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 344,932, Feb. 2, 1982, abandoned. This application Sep. 6, 1983, Ser. No. 529,653

Claims priority, application Japan, Feb. 6, 1981, 56-16595

Int. Cl.³ L07C *27/06, 31/04*

U.S. Cl. 518—713 **18 Claims**

1. In a process for preparing methanol which comprises reacting a gaseous mixture containing hydrogen and either one or both of carbon monoxide and carbon dioxide in the gaseous phase in the presence of a catalyst, the improvement wherein said catalyst comprises

(A) a substantially catalytically inert carrier in the form of spheres of 3 to 10 mm diameter, cylinders of 3 to 10 mm diameter and length of 2 to 10 mm or Raschig rings having a size of about 3 to about 15 mm and,

(B) supported thereon, in a thickness of 0.01 to 1.0 mm on the surface of the carrier, from 0.005 to 1 g in total, per gram of the carrier, of catalyst components comprising (i) a copper component, (ii) a zinc component, and optionally (iii) at least one metal component selected from aluminum, chromium, vanadium, magnesium and manganese.

4,507,404

PREPARATION OF HYDROCARBON MIXTURES FROM SYNGAS

Johannes K. Minderhoud, and Martin F. M. Post, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 24, 1984, Ser. No. 583,478

Claims priority, application Netherlands, Mar. 10, 1983, 8300873

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—714 **10 Claims**

1. A process for the preparation of a hydrocarbon mixture from a mixture of carbon monoxide and hydrogen, characterized in that for the preparation of a hydrocarbon mixture whose C_5^+ fraction has a high content of branched C_5 and C_6 paraffins, a H_2/CO mixture having a H_2/CO molar ratio between 1.0 and 5.0 is contacted with a catalyst mixture which has been prepared by dispersing a crystalline metal silicate which after one hour's calcination in air at 500° C. has the following properties:

(a) an X-ray powder diffraction pattern in which the strongest lines are the four lines given in Table A

Table A

d(Å)
11.1±0.2
10.0±0.2
3.84±0.07
3.72±0.06; and

(b) in which, in addition to SiO_2, one or more oxides of a trivalent metal A chosen from aluminum, iron, gallium, rhodium, chromium and scandium occur, the SiO_2/A_2O_3 molar ratio is higher than 10;

in water together with one or more precipitates which contain zinc and one or more metals chosen from chromium, copper and aluminum and which precipitates have been obtained by adding a basic reacting substance to one or more aqueous solutions of salts of the metals concerned, spray-drying the dispersion thus obtained and calcining the spray-dried material at a temperature between 425° and 525° C.

4,507,405

SYNTHETIC ARTICLES HAVING A CORK-LIKE APPEARANCE

Gary V. Paisley, Lilburn, and Alex Malaspina, Atlanta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jun. 17, 1982, Ser. No. 389,509

Int. Cl.³ C08F *9/10*

U.S. Cl. 521—841 **21 Claims**

1. A composition for forming a molded article having the external appearance resembling that of natural cork which comprises,

a thermoplastic resinous material as the major ingredient thereof,

a caramel colorant which is present in an amount sufficient to impart to the thermoplastic resinous material the color of natural cork, and

a blowing agent,

said thermoplastic resinous material being compatible with the caramel colorant and having a processing temperature which is not so high as to degrade the caramel colorant during the molding operation.

4,507,406

BLOWING AGENTS AND THEIR USE IN PREPARATIONS OF POLYESTER FOAMS

Helena Z. Kucharska, and Thomas M. Burton, both of Sarnia, Canada, assignors to Fiberglas Canada Inc., Toronto, Canada

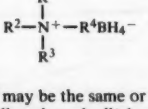
Filed May 4, 1984, Ser. No. 607,047

Claims priority, application Canada, Dec. 12, 1983, 443118

Int. Cl.³ C08J *9/06*

U.S. Cl. 521—85 **5 Claims**

1. A foamable composition comprising an unsaturated polyester containing a promotor and curing catalyst and a blowing agent comprising a quaternary ammonium borohydride of the formula:



where R^1, R^2 and R^3 may be the same or different and each is selected from alkyl, alkenyl, cycloalkyl, aryl, alkaryl and aralkyl groups and R^4 is selected from alkyl or alkenyl groups having from 1 to 30 carbon atoms.

4,507,407

PROCESS FOR IN SITU COLORATION OF THERMOSETTING RESINS

Edward W. Kluger, Pauline, and Patrick D. Moore, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

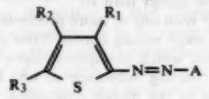
Filed Jun. 25, 1984, Ser. No. 624,377

Int. Cl.³ C08G *18/14, 18/32, 18/34, 18/38*

U.S. Cl. 521—113 **12 Claims**

1. A process for coloring polyurethane resins made by a

polyaddition reaction of a polyol and an isocyanate, which comprises adding to the reaction mixture before or during the polyaddition reaction a reactive coloring agent suitable for incorporation in the resin with the formation of covalent bonds, said coloring agent having the formula:



wherein R_1, R_2, R_3 are selected from halogen, carboxylic acid, alkanoyl, aryloyl, alkyl, aryl, cyano, sulfonylalkyl, sulfonylaryl, thioalkyl, thioaryl, sulfinylalkyl, sulfinylaryl, dithioalkyl, dithioaryl, thiocyano, amidoalkyl, amidodialkyl, oxyalkyl, oxyaryl, hydrogen, sulfonamidoalkyl, sulfonamidoaryl, sulfonamidodialkyl, sulfonamidodiaryl, carbocyclic forming polymethylene chains, sulfenamidoalkyl, sulfenamidodialkyl, sulfenamidoaryl, sulfenamidodiaryl, sulfinamidoalkyl, sulfinamidodialkyl, sulfinamidoaryl, sulfinamidodiaryl; and A is an organic dyestuff coupler that is resistant to stannous octanoate and flame retardant compounds and which has functionality through reactive substituents thereof.

4,507,408

BONDING AGENT COLD-HARDENING UNDER THE FORMATION OF POLYURETHANE FOR MOLDED PARTS, ITS MANUFACTURE AND ITS APPLICATION

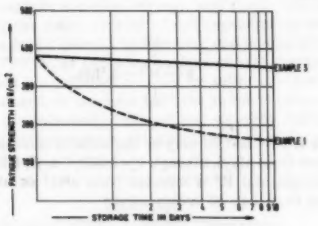
Marek A. Torbus, Duesseldorf, and Aleksandar Vujevic, Ratingen, both of Fed. Rep. of Germany, assignors to Huettenes-Albertus Chemische Werke GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 4, 1983, Ser. No. 538,975

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3237000

Int. Cl.³ C08L *75/04*

U.S. Cl. 523—143 **7 Claims**



1. A bonding agent cold-hardening under the formation of polyurethane for the production of molded foundry parts, consisting essentially of a polyol in the form of a solution of a phenol aldehyde condensate containing an OH group and a polyisocyanate, wherein the phenol aldehyde condensate is replaced wholly or partly by a co-condensate consisting of phenols, aldehydes and a hydroxy functional alkyl phenyl siloxane with a content of at least 3% by weight of free OH groups.

4,507,409

THIXOTROPIC MIXTURES OF LIQUID POLYESTERS AND POLYMER-TREATED FILLERS

James J. Jakubowski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 464,446, Feb. 7, 1983, abandoned. This application Feb. 2, 1984, Ser. No. 576,298

Int. Cl.³ C08K *3/10*

U.S. Cl. 523—205 **10 Claims**

1. A filled resin composition having thixotropic properties comprising

a. a liquid polyester; and

b. a solid filler which has been treated with a polymer of (1) an addition polymerizable organic monomer which does not contain an acid group, and (2) an addition polymerizable acid in an amount sufficient to enable the treated filler to impart thixotropic properties to said liquid polyester.

4,507,410

SILICA BONDED TIN URETHANE CATALYSTS

Edward R. Falardeau; Kurt C. Frisch, Jr., and Michele R. Lock, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 6, 1984, Ser. No. 577,426

Int. Cl.³ C08G *18/24;* **C08K** *3/36;* **B01J** *21/08, 23/14*

U.S. Cl. 523—211 **15 Claims**

1. A solid catalyst composition suitable for use in polyurethane systems produced by

(1) contacting a silica compound containing reactive hydroxyl groups with a tin catalyst compound, and

(2) reacting said compounds at a temperature range from about 130° to about 165° C. under dynamic conditions whereby said tin catalyst compound is bonded to the surface of said silica compound by reacting with said reactive hydroxyl groups.

11. A urethane composition comprising a urethane elastomer, and a solid catalyst composition comprising a silica compound containing reactive hydroxyl groups, and a tin catalyst compound bonded to the surface of said silica compound by reacting with said reactive hydroxyl groups.

4,507,411

CROSS-LINKED POLYMER COMPOSITIONS AND PRODUCTION THEREOF

Kevin R. Gordon, Laleham-on-Thames; Jeffrey R. Kelsey, Ashford, and Ivan C. Stannard, Carshalton, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Sep. 24, 1981, Ser. No. 305,370

Claims priority, application United Kingdom, Sep. 26, 1980, 8031233

Int. Cl.³ C08L *63/10*

U.S. Cl. 523—436 **10 Claims**

1. A composition suitable for forming surface coatings, laminates or composite materials formed by bringing together the following components in parts by weight of the total weight;

(a) 200 to 450 parts of a first polymer containing carboxylic acid or anhydride groups, the extent of functionalization being from 1 to 50% by weight of the first polymer, said polymer being selected from the group consisting of a maleinized homopolymer or copolymer of a polydiolefin, maleinized natural rubber, maleinized linseed oil, maleinized soya bean oil and hydrolyzed derivatives thereof,

(b) 5 to 220 parts of a compound selected from the group consisting of a teritary amine, a ketimine and an oxazolidine and,

(c) 50 to 250 parts of a second polymer which is an epoxy resin capable of cross-linking with the first polymer at ambient temperature in the presence of the tertiary amine, ketimine or oxazolidine.

6. A method of forming a surface coating comprising apply-

ing to a surface the following components in parts by eight of the total weight;

(a) 200 to 450 parts of a first polymer containing carboxylic acid or anhydride groups, the extent of functionalization being from 1 to 50% by weight of the first polymer, said polymer being selected from the group consisting of a maleinized homopolymer or copolymer of a polydiolefin, maleinized natural rubber, maleinized linseed oil, maleinized soya bean oil and hydrolyzed derivatives thereof.

(b) 5 to 220 parts of a tertiary amine, a ketimine or an oxazolidine and,

(c) 50 to 250 parts of a second polymer which is an epoxy resin capable of cross-linking with the first polymer at ambient temperature in the presence of the tertiary amine, ketimine or oxazolidine.

4,507,412

HIGH SOLIDS COATINGS FROM ADDUCTS OF POLYEPOXIDES WITH POLYAMINES AND BLOCKED POLYISOCYANATES

Richard A. Hickner, and Michael B. Cavitt, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 479,533, Mar. 28, 1983,. This application Jul. 6, 1984, Ser. No. 628,546

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—454 **38 Claims**

1. A composition which is curable at temperatures above about 120° C. consisting essentially of

(A) an adduct of

(1) an epoxy resin having an average of more than one epoxy group per molecule and an average epoxide equivalent weight of from about 140 to about 1000 and

(2) a polyamine compound having at least two amine groups selected from primary amine groups, secondary amine groups or mixture of such

groups per molecule;

(B)

(1) a material containing an average of more than one NCO group per molecule which NCO groups have been substantially fully blocked with

(2) ketoximes, aldoximes, lactams, N-hydroxy-imides or alcohols; and optionally

(C) any one or more of fillers, pigments, dyes, flow control agents or solvents;

and wherein

(a) components (A-1) and (A-2) are employed in quantities which provide from about 0.9 to about 20, moles of polyamine compound per epoxide equivalent; and

(b) components (A) and (B) are employed in quantities which provide a ratio of latent NCO groups in component (B) per primary and/or secondary amine group in component (A) of from about 0.75:1 to about 2:1.

4,507,413

PROCESS FOR THE PREPARATION OF COATING COMPOSITIONS, AQUEOUS DISPERSIONS OF PU REACTIVE SYSTEMS AND THEIR USE FOR COATING

Wilhelm Thoma; Rolf Langel; Anton Schmitz, and Walter Schröer, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1983, Ser. No. 520,966

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231062

Int. Cl.³ C09D *3/72;* **C08L** *75/08;* **D06N** *3/14;* **C14C** *11/00*

U.S. Cl. 524—42 **11 Claims**

1. A process for the preparation of finely dispersed, easily spreadable, aqueous polyurethane reactive coating compositions suitable for coating textile sheet products, artificial leather or leather by the direct or transfer coating process, which comprises

(i) forming an aqueous dispersion having a solids content of about 20–69 wt. % of

(a) blocked isocyanate prepolymers in the presence of

(b) from about 0.05–5% by weight, based on (a), of emulsifiers,

(ii) adding before, during or after formation of the dispersion

(c) optionally levelling agents, pigments, fillers or stabilizers and

(d) about 0.1 to 2.5% by weight, based on (a), of water soluble thickeners based on long chain polyethylene oxides, salts of poly(meth)acrylic acids or salts of carboxy methyl cellulose,

(iii) adding after formation of the dispersion

(e) up to 100% by weight of polymer solid substance, based on (a) of aqueous polymer solutions and/or polymer dispersions, and

(iv) forming said coating composition having a viscosity of from about 3000 to 22,000 mPa.s/25° C. and with a solids content of about 20–69% by weight, by adding before, during or after formation of the dispersion,

(f) approximately equivalent quantities, based on the blocked isocyanate groups of (a), of (cyclo)aliphatic di- and/or polyamines.

4,507,414

SMOKE RETARDANT VINYL HALIDE POLYMER COMPOSITIONS

Arthur W. McRowe, Akron, and Randall J. Brown, Sheffield Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 14, 1982, Ser. No. 378,377

Int. Cl.³ C08K *5/09, 3/26*

U.S. Cl. 524—100 **10 Claims**

1. An improved flame resistant low smoke generating vinyl halide polymer composition comprising a vinyl halide polymer, smoke retarding amounts of copper oxalate and an amine molybdate, and one to less than twenty weight parts each, per one hundred weight parts of vinyl halide polymer, of an alkaline earth metal carbonate.

4,507,415

MEDICAL ARTICLES

Masaaki Kasai, Zama; Toshiji Ichikawa, Chofu, and Kimiho Kosegaki, Yokkaichi, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1983, Ser. No. 478,073

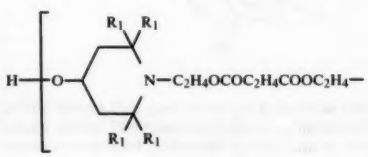
Claims priority, application Japan, Mar. 27, 1982, 57-48159; Mar. 27, 1982, 57-48160

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—101 **15 Claims**

1. An irradiation-sterilizable medical article molded from a composition comprising as the stabilizers from 0.01 to 0.4 part by weight of a hindered amine represented by the formula [I] or [II] below and from 0.01 to 0.4 part by weight of a phenol or its phosphite ester compound represented by the formula [III], or [V] below per 100 parts by weight of a propylene polymer with a weight-average molecular-weight to number-average molecular-weight ratio of 5 or below.

[I]



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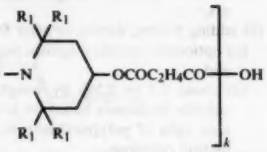
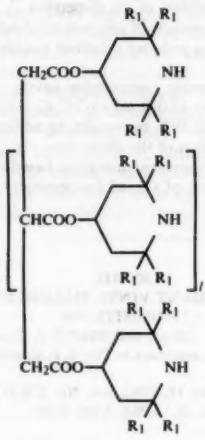
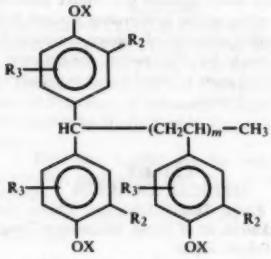


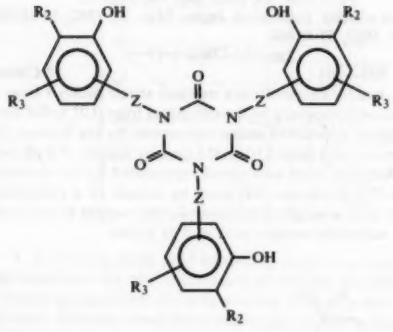
[II]



[III]



[V]



wherein:

R_1 represents an alkyl group containing 1–12 carbon atoms;

R_2 represents an alkyl group containing 3–12 carbon atoms;

R_3 represents an alkyl group containing 1–18 carbon atoms;

X represents hydrogen atom or the group

in which R_4 is an alkyl group containing 1–30 carbon atoms;

Y represents a divalent hydrocarbon radical containing 1–18 carbon atoms or sulfur atom; P1 Z represents a divalent hydrocarbon radical containing 1–8 carbon atoms in which a carbonyloxy group may be interposed;

k is an integer of 1–10;

l is an integer of 1–16; and

m is an integer of 1–6.

4,507,416

2,4,6-TRIS(SUBSTITUTED PHENOXY)-1,3,5,2,4,6-TRIOXATRIPHOSPHORINANES AS STABILIZERS

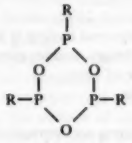
Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 12, 1983, Ser. No. 493,894

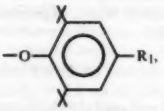
Int. Cl.[3] **C08K** *5/52;* **C07F** *9/15*

U.S. Cl. 524—101 **23 Claims**

1. A composition comprising organic materials subject to degradation and stabilizing amounts of 2,4,6-tris(substituted phenoxy)-1,3,5,2,4,6-trioxatriphosphorinanes having the structural formula

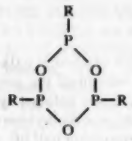


wherein R is

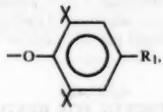


+ is t-butyl or t-pentyl and R_1 is hydrogen, primary, secondary, and tertiary alkyl radicals containing 1 to 9 carbon atoms, cycloalkyl radicals containing 3 to 6 carbon atoms, halogen, cyano, alkoxy radicals containing 1 to 8 carbon atoms, phenyl, $COOR_2$ esters wherein R_2 is an alkyl radical containing 1 to 8 carbon atoms, $—CH_2CH_2COOR_3$ wherein R_3 is an alkyl radical containing 1 to 18 carbon atoms, and $—C(CH_3)_2CON(R_4)_2$ wherein R_4 is an alkyl radical containing 1 to 9 carbon atoms, and (2) hindered or partially hindered phenols selected from the group consisting of hydroxyphenylalkyleneyl isocyanurates, tetrakis[methylene 3-(3',5'-dialkyl-4'-hydroxyphenyl)-propanoate]methanes wherein the alkyl groups contain 1 to 8 carbon atoms, alkyl 3-(3',5'-di-t-butyl-4'-hydroxyphenyl)propionates wherein the alkyl groups contain 1 to 18 carbon atoms, 1,3,5-trimethyl-2,4,6-tris[3,5-dialkyl-4-hydroxybenzyl]-benzene wherein the alkyl groups contain 1 to 5 carbon atoms, 1,3,5-tris(3,5-di-t-butyl-4-hydroxy-hydrocinnamoyloxyethyl)-s-triazine-2,4,6(1H,3H,5H)-trione, and 2,2'-alkylidene bis(4,6-dialkylphenols) wherein the alkyl groups contain 1 to 8 carbon atoms.

18. 2,4,6-tris(substituted phenoxy)-1,3,5,2,4,6-trioxatriphosphorinanes having the structural formula



wherein R is



+ is t-butyl or t-pentyl and R_1 is hydrogen, primary, secondary, and tertiary alkyl radicals containing 1 to 9 carbon atoms, cycloalkyl radicals containing 3 to 6 carbon atoms, halogen, cyano, alkoxy radicals containing 1 to 8 carbon atoms, phenyl, $-COOR_2$ esters wherein R_2 is an alkyl radical containing 1 to 8 carbon atoms, $-CH_2CH_2COOR_3$ wherein R_3 is an alkyl radical containing 1 to 18 carbon atoms, and $-C(CH_3)_2CON(R_4)_2$ wherein R_4 is an alkyl radical containing 1 to 9 carbon atoms.

4,507,417

STABILIZERS FOR SYNTHETIC RESINS

Tamaki Ishii, Suita; Shinichi Yachigo, and Yukoh Takahashi, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

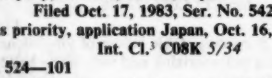
Filed Oct. 17, 1983, Ser. No. 542,518

Claims priority, application Japan, Oct. 16, 1982, 57-182006

Int. Cl.³ C08K *5/34*

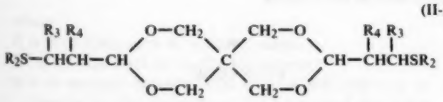
U.S. Cl. 524—101 **5 Claims**

1. A stabilizer for synthetic resins, of which the effective ingredient is a mixture composed of a 1,3,5-tris{2-[3-(3-t-butyl-4-hydroxy-5-methylphenyl)propionyloxy]ethyl}isocyanuric acid (I) and at least one sulfur-containing compound (II) selected from compounds represented by the general formulas (II-1) and (II-2):



(II-1)

wherein R_1 is an alkyl group having 4 to 20 carbon atoms, and



(II-2)

wherein R_2 is an alkyl group having 3 to 18 carbon atoms, and R_3 and R_4 each independently is a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, in the ratio (I):(II) of 1:0.5–15 by weight.

4,507,418

RUBBER COMPOUND FOR CONVEYOR BELTS

Tadashi Utsunomiya, Yokohama; Yasuhiko Matsumuro, Tokyo, and Hideaki Saigo, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limiited, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 536,970

Claims priority, application Japan, Oct. 6, 1982, 57-175889

Int. Cl.³ C08K *5/10*

U.S. Cl. 524—318 **18 Claims**

1. A rubber compound suitable for use in making conveyor belts, comprising:

100 parts by weight of a vulcanized base rubber; and

2 to 100 parts by weight of an organic carboxylate, said rubber compound being prepared by blending said organic carboxylate into a base rubber and vulcanizing the resulting blend or by impregnating the organic carboxylate in a surface of said vulcanized base rubber wherein when said rubber compound is formed into a sheet, said organic carboxylate bleeds at the surface of said sheet to prevent the adhesion of materials to said sheet.

4,507,419

CONTACT ADHESIVES

Wolfgang Hesse, Taunusstein; Richard Sattelmeyer, Wiesbaden, and Erich Schunck, Hochheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,391

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240396

Int. Cl.³ C08K *5/13*; C08L *75/04*

U.S. Cl. 524—327 **12 Claims**

1. Contact adhesive comprising (a) a solution of polyurethane rubber in a conventional solvent combined with (b) 2.5 to 100% by weight of a phenolate of at least one of the metals titanium, zirconium and aluminum as reinforcing agent, the percentage figure being referred to the solid polyurethane rubber.

4,507,420

PHENOLS AND USE THEREOF AS STABILIZERS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

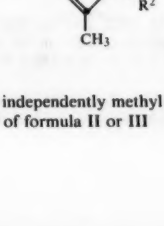
Continuation of Ser. No. 520,373, Aug. 4, 1983, abandoned, which is a continuation of Ser. No. 445,890, Dec. 1, 1982, abandoned. This application Feb. 1, 1984, Ser. No. 575,957

Claims priority, application Switzerland, Dec. 3, 1981, 7734/81

Int. Cl.³ C07C *39/16, 149/36*; C10M *1/20, 1/42*; C08K *5/36, 5/13*

U.S. Cl. 524—331 **7 Claims**

1. A compound of formula I

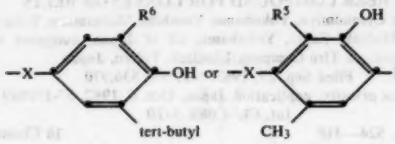


(I)

wherein

R^1 and R^4 are independently methyl or tert-butyl,

R^2 is a radical of formula II or III



(II) (III)

wherein

R^5 and R^6 are independently methyl or tert-butyl and

X is $—CH_2—$ or $—CH_2SCH_2—$.

7. A stabilized polymer composition which comprises

(a) a graft polymer based on acrylonitrile, butadiene and styrene or impact-resistant polystyrene, and

(b) an effective amount of a compound according to claim 1.

4,507,421

ADHESIVE CONTAINING ZINC POWDER

Detlef Symietz, Oberursel, Fed. Rep. of Germany, assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 360,614, Mar. 22, 1982, abandoned. This application Jan. 23, 1984, Ser. No. 572,879

Claims priority, application United Kingdom, Mar. 24, 1981, 8109152

Int. Cl.³ C08K *3/26, 3/08;* **B23K** *11/10*

U.S. Cl. 524—425 **8 Claims**

1. A spot welding sealant composition which is plastic at room temperature and consisting essentially of thermoplastic synthetic polymeric material and finely divided metallic zinc in an amount from about 0.5 up to about 15 percent by weight and where the sealant composition can be applied in the form of a plastic mass to metal parts to provide a deformable seal bonded to the metal parts after the metal parts have been secured together by spot welding.

4,507,422

WATER SOLUBLE POLYMERS AND DISPERSIONS CONTAINING THEM

David Farrar, and Malcolm Hawe, both of West Yorkshire, England, assignors to Allied Colloids Limited, Bradford, England

Filed May 21, 1984, Ser. No. 612,516

Claims priority, application United Kingdom, May 20, 1983, 8313976; Aug. 12, 1983, 8321731

Int. Cl.³ C09D *3/74, 3/80*

U.S. Cl. 524—425 **19 Claims**

1. A dispersion of pigment in an aqueous medium containing a dispersing agent for the pigment and in which the dispersing agent is a water soluble polymer formed from one or more ethylenically unsaturated monomers comprising acidic monomers selected from acrylic acid and 2-acrylamido-2-methyl propane sulphonic acid, or a water soluble salt thereof, and which has PD below 1.5 and Mw (measured as the sodium salt) of from about 1,000 to about 5,000.

4,507,423

MODIFIED POLYOLEFIN COMPOSITE MATERIAL WITH IMPROVED PROPERTIES

Isao Sasaki, Hiroshima; Yasuaki Ii, Otake, and Hiroshi Mori, Iwakuni, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,386

Claims priority, application Japan, Jun. 29, 1982, 57-112428

Int. Cl.³ C08K *5/14, 3/00;* **C08L** *51/08*

U.S. Cl. 524—427 **10 Claims**

1. A polyolefin resin composition comprising:

(1) a modified polyolefin prepared by reacting a polyolefin with an unsaturated carboxylic acid in the presence of a catalyst, and

(2) a reinforcement;

wherein:

(a) the amount of the catalyst is 0.03 to 2 parts by weight per 100 parts by weight of the polyolefin;

(b) the catalyst is a mixed catalyst system of:

(i) a ketal peroxide or a dialkyl peroxide, said peroxides having a decomposition half life of at least 10 hours at a temperature of at least 80° C., and

(ii) benzoyl peroxide,

where the ratio of the ketal peroxide or the dialkyl peroxide to benzoyl peroxide is from about 1/10 to 10/1, and

(c) the amount of the unsaturated carboxylic acid is 0.05 to 0.8 parts by weight per 100 parts of the polyolefin.

4,507,424

COMPOSITIONS USEFUL FOR RESTORING GROUT

Daniel R. Webster, St. Louis Park, Minn., assignor to C.T.R. Inc., St. Louis Park, Minn.

Filed May 29, 1984, Ser. No. 614,489

Int. Cl.³ B08B *7/00;* **C09D** *3/80;* **C11D** *3/14, 7/02*

U.S. Cl. 524—442 **9 Claims**

1. An alkaline liquid latex composition for restoring grout consisting essentially of the following:

about 30–60% water,

about 5–15% of a dispersed film-forming polymeric resin,

a surfactant compatible with said resin,

about 10–25% of an alkali metal salt selected from the group consisting of sodium metasilicate, sodium carbonate, sodium bicarbonate and mixtures thereof,

about 2–10% sodium hypochlorite,

pigment, and

an amount of zinc oxide effective to set the composition when it is applied to grout and dried.

4,507,425

PROCESS FOR PREPARING STABLE POLY(VINYLIDENE HALIDE) LATICES

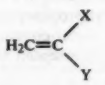
David E. Weaver, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 12, 1984, Ser. No. 570,053

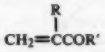
Int. Cl.³ C08L *27/06*

U.S. Cl. 524—460 **17 Claims**

1. A method for preparing stable latices of vinylidene halide polymers comprising polymerizing said vinylidene halide monomers having the formula



wherein X is a halogen selected from the group consisting of chlorine, bromine or fluorine and Y is hydrogen or a halogen as defined, in water, in the presence of a free radical initiating catalyst and about one to thirty weight parts of a polymer additive, per one hundred weight parts of monomers, of a water soluble salt of a copolymer of an olefinically unsaturated carboxylic acid monomer and at least one copolymerizable comonomer of the formula



wherein R is hydrogen or an alkyl group containing 1 to 4 carbon atoms and R' is an alkyl group containing 1 to 12 carbon atoms, said copolymer having an acid number of greater than 50 to about 450 and a weight average molecular weight of about 2,000 to about 50,000.

4,507,426

SYNERGISTIC MIXTURE OF POLYURETHANE AND EMULSION POLYMERS USEFUL AS THICKENERS FOR AQUEOUS SYSTEMS

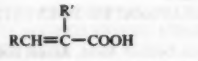
Donald M. Blake, Jr., Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 3, 1983, Ser. No. 455,440
Int. Cl.[3] C08L *53/00*; C08F *8/30*
U.S. Cl. 524—505 5 Claims

1. A thickening composition comprising

(a) a syneresis reducing amount of a liquid emulsion polymer comprising the copolymerization product of

(i) about 15 to about 60 weight percent of an addition polymerizable acid monomer which is represented by the formula:



(I)

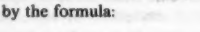
where

R is H and R′ is H, C_1–C_4 alkyl, or $—CH_2COOX$;

R is —COOX and R′ is H or $—CH_2COOX$; or

R is CH_3 and R′ is H; and X is H or C_1–C_4 alkyl,

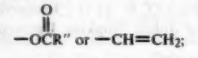
(ii) about 15 to about 80 weight percent of an addition polymerizable nonionic vinyl monomer which is represented by the formula:



(II)

where

Y is H and Z is —COOR, $—C_6H_4R'$, CN, Cl,



or $—CH=CH_2$;

Y is CH_3 and Z is —COOR, $—C_6H_4R'$, CN or $—CH=CH_2$; or

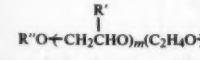
Y and Z are Cl; and

R is C_1–C_8 alkyl or C_2–C_8 hydroxyalkyl;

R′ is H, Cl, Br, or C_1–C_4 alkyl;

R″ is C_1–C_8 alkyl, and

(iii) about 1 to about 30 weight percent of a nonionic vinyl surfactant ester which is represented by the formula:



(III)

where

R is H or CH_3; each R′ is C_1–C_2 alkyl;

R″ is C_8–C_{20} alkyl or C_8–C_{16} alkylphenyl;

n is an average number from about 6–100 and m is an average number from about 0–50 provided that $n \geqq m$ and $\Sigma(n+m)$ is about 6–100; and

(b) a thickening amount of a urethane polymer having at least three hydrophobic groups, at least two of which are terminal hydrophobic groups, said hydrophobic groups being linked by hydrophilic groups.

4,507,427

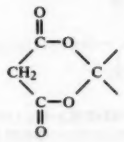
PROCESS FOR PRODUCTION OF POLYISOCYANATES CONTAINING AT LEAST PARTLY BLOCKED ISOCYANATE GROUPS, COMPOUNDS OBTAINABLE BY THIS PROCESS AND THEIR USE IN PRODUCTION OF POLYURETHANES, STOVING LACQUERS OR AQUEOUS POLYISOCYANATE SOLUTIONS OR DISPERSIONS

Terry A. Potter, New Martinsville, W. Va.; Klaus Nachtkamp, Cologne, and Franz Weider, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 628,372
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1983, 3326188
Int. Cl.[3] C08G *18/80*
U.S. Cl. 524—591 15 Claims

1. A process for the production of an organic polyisocyanate containing at least partly blocked isocyanate groups which comprises at least partly blocking the isocyanate groups of an organic polyisocyanate reactant with a blocking agent for isocyanate groups comprising

(a) a cyclic dicarbonyl compound containing the following characteristic structural unit



and, optionally,

(b) a blocking agent for isocyanate groups other than (a), the blocking agent (a) being used in quantities corresponding to a molar ratio of blocking agent (a) to isocyanate groups in the organic polyisocyanate reactant of at least about 0.1:1 and, when used, optional blocking agent (b) being reacted with said organic polyisocyanate before, during or after the reaction of said organic polyisocyanate reactant with the blocking agent (a).

4,507,428

AQUEOUS DISPERSIONS OF POLYAMINES AND POLY(DIHYDROBENZOXAZINES)

Harold P. Higginbottom, Wilbraham, and Manuel F. Drumm, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 17, 1984, Ser. No. 581,389
Int. Cl.[3] C08L *61/12, 79/04*
U.S. Cl. 524—596 26 Claims

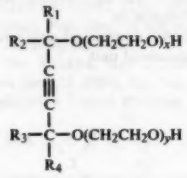
1. An aqueous dispersion comprising a poly(3,4-dihydro-3-substituted-1,3-benzoxazine) and a protonated reactive polyamine, wherein the poly(dihydrobenzoxazine) is of number average molecular weight in the range of about 250 to about 2000, with the majority of the individual molecules containing at least two dihyrobenzoxazine groups, and is the reaction product of about 1 equivalent of a primary amine selected from the group consisting of mono- and poly-primary amines, about 1 equivalent of a phenol selected from the group consisting of mono- and poly-phenols having phenolic hydroxy groups with at least one unsubstituted position ortho to such hydroxy groups and about 2 equivalents of formaldehyde, wherein the protonated reactive polyamine is at least difunctional, the reactive groups being primary or secondary amine and wherein protonation is supplied by an inorganic or organic acid.

4,507,429
PRESSURE SENSITIVE ADHESIVES WITH IMPROVED SHEAR RESISTANCE

William E. Lenney, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 12, 1984, Ser. No. 570,126
Int. Cl.[3] C08F 220/12, 2/20
U.S. Cl. 524—800 20 Claims

1. In a pressure sensitive adhesive composition containing a polymer which comprises an interpolymer of an alkyl acrylate or vinyl ester, or both, an olefinically unsaturated carboxylic acid comonomer, and a polyolefinically unsaturated copolymerizable monomer for enhancing cohesive strength of the interpolymer and having a Tg of −10° C. or below, the interpolymer being formed by an aqueous emulsion polymerization process, the improvement which comprises effecting the aqueous emulsion polymerization of the interpolymer in the presence of a stabilizer system comprising (a) a hydroxypropyl methyl cellulose and (b) an ethoxylated acetylenic glycol of the formula:



in which R_1 and R_4 are alkyl (C_3–C_{10}) radicals, R_2 and R_3 are methyl or ethyl, and x and y have a sum in the range of about 3 to 60, inclusive.

4,507,430
WATER-BASE POLYURETHANE EMULSION

Shigeru Shimada; Akira Kuroda; Junichi Tomiuga, and Shinzi Ishikawa, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 523,761, Aug. 17, 1983, abandoned. This application Aug. 3, 1984, Ser. No. 637,267
Claims priority, application Japan, Dec. 20, 1982, 57-221968
Int. Cl.[3] C08G 18/62; C08L 75/04
U.S. Cl. 524—839 11 Claims

1. A water-base polyurethane emulsion useful as an adhesive or coating material for a polyolefin resin, which comprises a polyol component and a polyisocyanate component, characterized in that a hydrogenated polyalkadiene polyol is used as the polyol component.

9. A water-base polyurethane emulsion useful as an adhesive or coating material for a polyolefin resin, which is prepared by reacting a hydrogenated polybutadiene polyol with a polyisocyanate compound to form a polyurethane prepolymer and emulsifying the polyurethane prepolymer in water.

4,507,431
PREPARATION OF CROSSLINKED POLYURETHANE IONOMER DISPERSIONS

Herbert Stutz, Karlsruhe, and Günter Eckert, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 8, 1983, Ser. No. 530,384
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233605
Int. Cl.[3] C08L 75/04; C08G 18/10
U.S. Cl. 524—840 1 Claim

1. A process for preparing aqueous dispersions of crosslinked polyurethane ionomers, comprising:

(a) mixing an isocyanate-containing prepolymer dissolved in a water-miscible organic solvent having a boiling point of from 20° to 100° C. with a polyfunctional polyisocyanate cross-linking compound having an isocyanate functionality of about 2.2 to 4; said isocyanate-containing prepolymer being prepared from a linear polyhydroxy compound having a molecular weight of from 800 to 5,000, said prepolymer having exclusively aliphatic or cycloaliphatic terminal isocyanate groups in amounts from 0.1 to 2% by weight incorporated therein by employing an aliphatic diisocyanate and/or cycloaliphatic diisocyanate compound alone as the diisocyanate reactant with said polyhydroxy compound or in conjunction with a non-aliphatic or non-cycloaliphatic diisocyanate reactant, and containing salt groups in amounts of from 0.02 to 1% by weight, so that there are from 0.1 to 1.5 isocyanate groups of said polyisocyanate per isocyanate group of said prepolymer;

(b) dispersing the resulting solution in from 40 to 80% by weight based on the polyurethane prepolymer and the polyisocyanate, of water; and

(c) evaporating the organic solvent.

4,507,432
CURING METHOD FOR UNSATURATED POLYESTER RESIN

Shigeki Banno, and Takeshi Komai, both of Aichi, Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

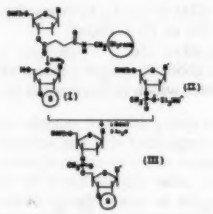
Filed Oct. 24, 1983, Ser. No. 544,638
Claims priority, application Japan, Nov. 1, 1982, 57-190726
Int. Cl.[3] C08L 67/06; 63/10
U.S. Cl. 525—21 13 Claims

1. In a curing method for an unsaturated polyester resin by the steps of adding an organic peroxide either alone or, optionally, in conjunction with a curing accelerator or some other additive to an unsaturated polyester resin and curing said unsaturated polyester resin, the improvement comprising further adding 4-methyl-2,4-diphenyl-pentene-1 to said unsaturated polyester resin in an amount of at least 0.1% by weight of said unsaturated polyester.

4,507,433
PREPARATION OF OLIGODEOXYRIBONUCLEOSIDE ALKYL OR ARYLPHOSPHONATES

Paul S. Miller, Baltimore, and Paul O. P. Ts'O , Lutherville, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 7, 1983, Ser. No. 540,185
Int. Cl.[3] C07H 21/02, 21/04
U.S. Cl. 525–54.11 15 Claims



1. A process for synthesizing oligonucleoside alkyl or arylphosphonates which comprises condensing (1) a 5'-protected nucleoside 3'-alkyl or arylphosphonate alkylammonium salt with (2) a 5'-hydroxy nucleoside or oligomer thereof attached through its 3' position to a polymer support whereby condensation takes place between the 5'-hydroxy group of (2) and the alkylammonium group of (1), repeating said condensation if and as appropriate to obtain the oligonucleoside alkyl or aryl phosphonate of desired length attached to the support and then cleaving the oligomer product from the support by treating the same with a diamino alkane whereby the oligomer is cleaved

from the support and base protecting groups are removed without hydrolysis of phosphonate linkages.

4,507,434

BLENDS OF VINYL HALIDE-POLYOLEFIN GRAFT POLYMERS AND POLYCARBONATE POLYMERS

Gautam R. Ranade, Grand Island, and Gideon Salee, Williamsville, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1983, Ser. No. 541,230
Int. Cl.³ C08L *51/06, 69/00*
U.S. Cl. 525—67 **9 Claims**

1. A polymer composition consisting essentially of a vinyl halide hydrocarbon polyolefin graft polymer and a polycarbonate.

4,507,435

BLENDS OF POLYVINYL CHLORIDE AND COPOLYMERS CONTAINING PARA-METHYL STYRENE AND ACRYLONITRILE HAVING IMPROVED CLARITY

Edmond L. Suek, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,425
Int. Cl.³ C08L *51/04, 55/02, 27/06*
U.S. Cl. 525—86 **11 Claims**

1. A composition comprising a polyvinyl chloride polymer and a graft copolymer of acrylonitrile, diene and as the sole alkenyl aromatic hydrocarbon, methyl styrene containing at least 90 percent of the para-isomer, said composition having improved clarity compared to the corresponding composition in which the graft copolymer contains styrene instead of para-methyl styrene.

4,507,436

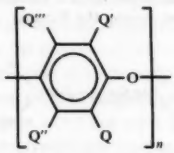
COMPOSITIONS OF POLYPHENYLENE ETHER RESIN AND POLY(TETRA-ALKYLATED BISPHENOL) HAVING REDUCED MELT VISCOSITY

Robert J. Axelrod, Glenmount; John R. Campbell, Clifton Park, and Sai-Pei Ting, Delmar, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Jan. 13, 1983, Ser. No. 457,630
Int. Cl.³ C08L *53/00*
U.S. Cl. 525—92 **10 Claims**

1. A thermoplastic composition comprising:

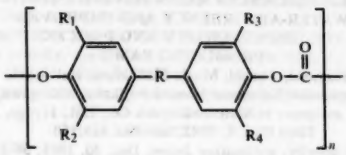
(a) a polyphenylene ether resin which is a homopolymer or copolymer having units of the formula



wherein Q, Q', Q'', Q''' are independently selected from the group consisting of hydrogen, halogen, hydrocarbon radicals, halohydrocarbon radicals, hydrocarbonoxy radicals and halohydrocarbonoxy radicals; and n represents the total number of monomer units and is an integer of at least about 20;

(b) a rubber modified, high impact polystyrene resin; and

(c) a melt viscosity reducing amount of an aromatic polycarbonate consisting of a tetraalkyl substituted bisphenol polycarbonate having units of the formula



in which R is alkylidene having from 1 to 10 carbon atoms or cycloalkylidene having from 5 to 8 carbon atoms in the cyclic ring; R_1, R_2, R_3, and R_4 are the same or different and represent alkyl having from 1 to 3 carbon atoms; and n represents the total number of monomer units and is an integer of at least 10.

4,507,437

CURABLE COMPOSITION

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1983, Ser. No. 564,905
Claims priority, application Japan, Dec. 30, 1982, 57-231829
Int. Cl.³ C08F *8/00*
U.S. Cl. 525—106 **13 Claims**

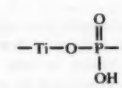
1. A curable composition comprising (I) a vinyl polymer having on the main polymer chain end or a side chain thereof at least one silyl group containing a silicon atom to which a hydrolyzable group is linked, per one polymer molecule, the main chain of the vinyl polymer consisting essentially of a polymer of a vinyl monomer, and (II) a hardener containing (a) at least one organic phosphorus-containing compound having a P—OH linkage in the molecular and being selected from the group consisting of organic acid phosphates of the general formulas:

$$(R^3O)_x(R^4O)_yP(O)(OH)_{2-m} \text{ and } R_x^3R_y^4P(O)(OH)_{2-m}$$

wherein R^3 and R^4 are an organic group, m is 0 or 1, and x and y are 0, 1 or 2 provided that the sum of x and y is 1 or 2; organic acid phosphites of the general formulas:

$$(R^3O)_x(R^4O)_yP(OH)_{2-m} \text{ and } R_x^3R_y^4P(OH)_{2-m}$$

wherein R^3, R^4, m, x and y are as defined above, and an organic acid titanium phosphate containing a



linkage between organic groups and (b) an amine compound reactable with the at least one organic phosphorus-containing compound.

4,507,438

WATER-ABSORBENT RESIN HAVING IMPROVED WATER-ABSORBENCY AND IMPROVED WATER-DISPERSIBILITY AND PROCESS FOR PRODUCING SAME

Shigeji Obayashi, Akashi; Morio Nakamura, Kakogawa; Takushi Yamamoto, Kobe, and Masato Fujikake, Kakogawa, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo, Japan

Filed Dec. 9, 1982, Ser. No. 448,150

Claims priority, application Japan, Dec. 30, 1981, 56-213885

Int. Cl.[3] C08L *3/02, 9/00, 31/04, 33/06*

U.S. Cl. 525—119 16 Claims

1. A process for producing a water-absorbent resin having an improved water-absorbency, characterized by crosslinking a crosslinked carboxylate-containing water-absorbent resin wherein said resin is acrylate homopolymer, acrylate copolymer, methacrylate homopolymer, or methacrylate copolymer with 0.005–5% by weight of a crosslinking agent having at least two functional groups capable of reacting with a reactive group of said resin wherein said reactive group is selected from the class of carboxylate, hydroxyl, sulfonic acid, and amino in the presence of water in a proportion of 0.01 to 1.3 parts by weight per part by weight of the resin in 0.1 to 50 parts by weight, per part by weight of said resin of an invert solvent which does not affect the water-absorbent resin.

4,507,439

ELASTOMERIC COMPOSITIONS CONTAINING TREATED PTFE

Charles W. Stewart, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1983, Ser. No. 555,488

Int. Cl.[3] C08L *27/22, 27/16, 27/18*

U.S. Cl. 525—199 14 Claims

1. An elastomeric composition comprising an fluoroelastomer matrix having dispersed therein about 3–30 parts per 100 parts by weight, based on the fluoroelastomer, of powdered polytetrafluoroethylene having a number average molecular weight of at least about 250,000 and a surface area of at least 1 m^2/g, as determined by the BET technique, which powdered polytetrafluoroethylene has been treated with an amount of an addition compound of an alkali metal of about 50–120% of the theoretical amount required for the alkali metal to react with all the fluorine atoms on the surface of the polytetrafluoroethylene.

4,507,440

CROSS-LINKABLE AND CROSS LINKED MACROMOLECULAR COMPOSITIONS WHEREIN CROSS-LINKING IS BY STRUCTURAL BRIDGES OF THE FORMULA —NR^x—CH=N—CO— AND THEIR PREPARATION

Friedrich Engelhardt, Frankfurt; Steffen Piesch, Oberursel; Juliane Balzer, Frankfurt, all of Fed. Rep. of Germany, and Jeffery C. Dawson, Katy, Tex., assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany and Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 216,672, Dec. 15, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,682

Int. Cl.[3] C08L *33/26*

U.S. Cl. 525—218 26 Claims

1. A composition crosslinkable in an aqueous acidic medium comprising a compound having at least two formylamido groups and a polymer having at least two amidocarbonyl groups, the formylamido group and the amidocarbonyl group of said compound and polymer reacting in the aqueous acidic medium to form crosslink bridges of structural units of the formula —NR^x—CH=N—CO—, wherein R^x represents hydrogen, alkyl having 1 to 4 carbon atoms or —CH_2OH.

4,507,441

ACCELERATORS FOR THE CURE OF EPOXY RESINS

John O. Goring, Kettering, England, assignor to Scott Bader Company Limited, Wollaston, England

Filed May 9, 1984, Ser. No. 608,572

Claims priority, application United Kingdom, May 16, 1983, 8313482; Feb. 2, 1984, 8402823

Int. Cl.[3] C08G *59/68, 59/42*

U.S. Cl. 525—438 10 Claims

1. A method of reacting a compound containing an epoxy group with a carboxylic acid compound which comprises heating a mixture of the compound containing an epoxy group and the carboxylic acid compound in the presence of an accelerator characterized in that the accelerator is a benzotriazole optionally substituted in the aromatic ring.

4,507,442

COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Daniel W. Fox; Bruce A. Kaduk, and John B. Starr, Jr., all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 188,177, Sep. 17, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,902

Int. Cl.[3] C08L *67/00, 69/00*

U.S. Cl. 525—439 4 Claims

1. A copolymer of a high molecular weight polyethylene arylate and a low or high molecular weight bisphenol A polycarbonate, said copolymer being of high molecular weight, transparent, being completely soluble in chlorinated solvents, and having one glass transition temperature.

4,507,443

SEALANT AND COATING COMPOSITION

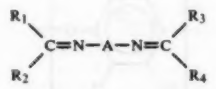
Larry R. Barron, Mentor, and Pao-Chi Wang, Strongsville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 23, 1984, Ser. No. 582,681

Int. Cl.[3] C08F *283/04*

U.S. Cl. 525—453 9 Claims

1. A sealant or coating admixture comprised of (a) a blocked isocyanate-terminated polymer in which essentially all NCO groups are blocked, (b) a multi-functional imine essentially free of amine functionality formed by the reaction between a primary multi-functional amine with a ketone or aldehyde, said multi-functional imine having the formula



wherein R_1, R_2, R_3, and R_4 are radicals each independently selected from the group consisting of hydrogen, an alkyl having from 1 to 10 carbon atoms and phenyl and wherein A is a radical having a molecular weight from 26 to 7000, and (c) from 0.1 to 10 parts by weight of an organosilane based upon 100 parts by weight of said blocked isocyanate-terminated polymer, said organosilane being selected from the group consisting of aminosilanes, the reaction product of a mercaptosilane with a monoepoxide, the reaction product of an epoxysilane with a secondary amine, and the reaction product of an aminosilane with an acrylic monomer.

4,507,444

HIGH-IMPACT POLYMER ALLOYS

Wilhelm Slawyk, Cologne; Gerhard Ballé, Leverkusen; Manfred Munzer, Bensheim, and Adolf Wohnhas, deceased, late of Darmstadt-Arheilgen, all of Fed. Rep. of Germany (by Hannelor R. I. Wohnhas), assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 095,821, Nov. 19, 1979, abandoned, which is a continuation of Ser. No. 016,633, Mar. 1, 1979, abandoned, which is a continuation of Ser. No. 915,705, Jun. 15, 1978, abandoned. This application Aug. 21, 1981, Ser. No. 295,177

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727480

Int. Cl.³ C08F *283/04*

U.S. Cl. 525—455 19 Claims

1. A process for the production of optically clear high-impact polymer alloys by the radically initiated polymerization of homogeneous mixtures of:

(A) from about 40 to 92%, by weight, of one or more monomeric esters of methacrylic acid and, optionally, small quantities of one or more copolymerizable vinyl monomers wherein from about 80–100 mol %, based on the total quantities of polymerizable monomers, of one or more monomeric esters of methacrylic acid and from about 0–20 mol %, based on the total quantity of polymerizable monmers, of one or more copolymerizable vinyl monomers are employed; and

(B) from about 8 to 60 parts of a substantially linear polyurethane urea elastomer; wherein the polyurethane urea elastomer is initially synthesized by polyaddition from:

(1) one or more substantially linear polyester, polyester amide, polyacetal or polycarbonate Polyols having a molecular weight of from about 500 to 6000 and, optionally, from about 0 to 20 mol %, based on the total polyol component, of diols having a molecular weight of from about 62 to 500;

(2) a polyisocyanate selected from the group consisting of isophorone diisocyanate, 4, 4'-dicyclohexyl methane diisocyanate and graft polymerization products of an aliphatic or cycloaliphatic diisocyanate and 10 to 100 parts by weight of a vinyl monomer per 100 parts of diisocyanate;

(3) one or more aliphatic or cycloaliphatic diamines; and, optionally,

(4) a saturated or olefinically unsaturated compound having monofunctional reactivity towards isocyanates;

by preparing a prepolymer containing from about 1 to 5%, by weight, of NCO groups from component (1) and (2) in a first stage, reacting the prepolymer dissolved in the polymerizable monomeric ester of methacrylic acid in a second stage with component (3) in an isocyanate:amino-equivalent ratio of between about 1.01:1 and 1.5:1, optionally in the presence of more copolymerizable vinyl monomers, until an about 20% solution of polyurethane urea in the monomer would have a viscosity of from about 200 to 30,000 cP at 20° C., optionally reacting any free NCO groups still present in a third reaction stage by adding component (4), adjusting the solids content of the solution to from about 8 to 60%, by weight, optionally by adding more vinyl monmers, and finally subjecting the mixture to radically initiated polymerization in known manner, optionally in molds.

4,507,445

HEAT-CURABLE EPOXIDE RESIN COMPOSITIONS

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,023

Claims priority, application United Kingdom, Oct. 12, 1982, 8229073; Oct. 12, 1982, 8229074

The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.

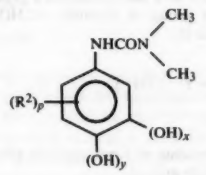
Int. Cl.³ C08G *59/62, 59/44*

U.S. Cl. 525—504 20 Claims

1. A heat-curable composition comprising

(a) an epoxide resin and

(b) an effective amount of a urea of formula



V

where

R^2 denotes —NH_2, —NO_2, —Cl, —Br, or alkyl of 1 to 10 carbon atoms,

p denotes zero, 1, or 2,

x and y each denote zero or 1, and

the sum of x+y is 1.

4,507,446

WATER-SOLUBLE OR WATER-DISPERSIBLE RESINOUS SULPHUR OR PHOSPHORUS CONTAINING SALTS, THEIR PREPARATION, AND THEIR USE IN COATINGS

Christopher G. Demmer, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

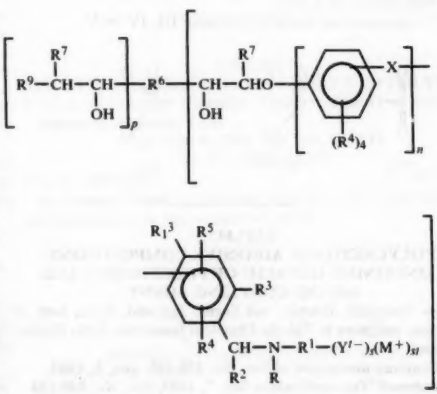
Filed Mar. 14, 1983, Ser. No. 474,904

Claims priority, application United Kingdom, Mar. 23, 1982, 8208401

Int. Cl.³ C07C *143/64;* C08G *18/58;* C08L *61/10;* C07F *9/38*

U.S. Cl. 525—523 9 Claims

1. A salt of the general formula I



(I)

where

R represents a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms,

R^1 represents an aliphatic, aromatic, or araliphatic di- or

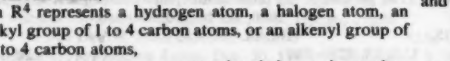
trivalent hydrocarbon group having up to 10 carbon atoms,

R^2 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms,

one of R^3 and $R^3{}_1$ represents a hydroxyl group and the other represents a hydrogen atom, a halogen atom, an alkyl group of 1 to 4 carbon atoms, or an alkenyl group of 2 to 4 carbon atoms,

each R^4 represents a hydrogen atom, a halogen atom, an alkyl group of 1 to 4 carbon atoms, or an alkenyl group of 2 to 4 carbon atoms,

R^5 represents an atom or a group bonded to a ring carbon atom which is ortho or para to the group R^3 or $R^3{}_1$ that represents a hydroxyl group, and is a hydrogen atom, a halogen atom, an alkyl group of 1 to 4 carbon atoms, an alkenyl group of 2 to 4 carbon atoms, a group of formula $-CH(R^2)OH$, a group of formula $-CH(R^2)OR^8$, or a group of formula II



(II)

R^6 represents the residue of a polyepoxide after removal of (m+p) 1,2-epoxide groups,

each of the substituents R^7 represents either a hydrogen atom or a covalent bond linked to the group R^6 to form a cycloaliphatic ring,

R^8 represents either an alkyl group of from 1 to 6 carbon atoms or an alkoxyalkyl group wherein the alkoxy group and the alkyl group each have from 1 to 6 carbon atoms,

R^9 represents the residue of a monohydric phenol, a secondary monoamine, or a monocarboxylic acid after removal of the hydrogen atom of the phenolic hydroxyl group, the secondary amino group, or the carboxylic acid group,

m represents 1, 2, 3 or 4,

n represents zero or 1,

p represents zero or 1 such that (m+p) is at least 2 and at most 4,

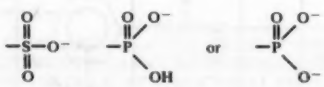
t represents 1 or 2,

X represents an alkylene or alkylidene group of 1 to 3 carbon atoms, a carbonyl or sulfonyl group, an oxygen or sulfur atom, or a valence bond,

M^+ represents a hydrogen ion, a cation derived from an alkali metal, ammonia, an amine, including quaternary ammonium cations, or one valence of a polyvalent cation, with the proviso that at least 25% of the ions M^+ represent a said cation,

s represents 1 or 2, and

Y^{t-} represents an anion of formulae III, IV or V



(III) (IV) (V)

4,507,447

POLYURETHANE ADHESIVE COMPOSITIONS CONTAINING OXYACID OF PHOSPHORUS AND SILANE COUPLING AGENT

Kyuya Yamazaki, Ibaraki, and Sachio Igarashi, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 455,895, Jan. 5, 1983, abandoned. This application Sep. 7, 1983, Ser. No. 530,124

Int. Cl.[3] **C08L** *63/02, 75/04*

U.S. Cl. 525—528 **9 Claims**

1. A polyurethane adhesive composition, which comprises an organic polyisocyanate, a polyol, about 0.01 to 10 weight percent based on the total adhesive composition of an oxyacid of phosphorus or a derivative thereof, about 1 to 50 weight percent based on the total adhesive composition of an epoxy resin and about 0.05 to 20 weight percent based on the total adhesive composition of a silane coupling agent and wherein the ratio of the number of the NCO groups of the organic polyisocyanate to the number of active hydrogen groups of the polyol, the oxyacid of phosphorus or the derivative thereof and the epoxy resin is in the range of about 0.4 to 20.

4,507,448

PROCESS FOR THE PRODUCTION OF POLYOLEFINS

Nobuyuki Kuroda, Yokohama; Toru Nakamura, Kawasaki; Yutaka Shikatani, Yokohama; Kazuo Matsuura, Tokyo, and Mitsuji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 217,755, Dec. 18, 1980, abandoned. This application May 4, 1982, Ser. No. 374,627

Claims priority, application Japan, Dec. 28, 1979, 54-173448

Int. Cl.[3] **C08F** *4/02, 10/00*

U.S. Cl. 526—125 **19 Claims**

1. A process for the production of polyolefins which comprises homopolymerizing or copolymerizing α-olefins at a temperature in the range of about 20° to 120° C. under a pressure in the range of about atmospheric to 70 kg./cm.[2] and in the presence of a catalyst comprising a solid catalyst component and an organo-aluminum compound, said solid catalyst component resulting from the reaction of:

(a) a magnesium dihalide,

(b) a compound represented by the formula:

$$Al(OR)_nX_{3-n}$$

where

R is a hydrocarbon residual group having 1 to 20 carbon atoms,

X is a halogen atom, and

n is 1 to 3,

(c) a compound represented by the general formula:

$$Si(OR')_mX_{4-m}$$

where

R' is a hydrocarbon residual group have 1 to 20 carbon atoms,

X is a halogen atom and

m is 1 to 4, and

(d) a titanium compound and/or a vanadium compound wherein:

the mol ratio of magnesium dihalide (a) to compound (b) expressed as Mg/Al is in the range of 1/0.05–1/0.5,

compound (c) is used in an amount of 0.1–50 grams per 100 grams of magnesium dihalide (a), and

the titanium compound and/or vanadium compound (d) is used in an amount such that the resulting solid catalyst component contains 0.5–10 percent by weight of titanium and/or vanadium.

4,507,449

OLEFIN POLYMERIZATION

Joel L. Martin, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

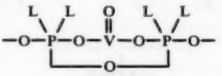
Filed Aug. 16, 1983, Ser. No. 523,535

Int. Cl.[3] **C08F** *4/44, 4/64, 210/00, 110/02*

U.S. Cl. 526—122 **16 Claims**

1. A process for the production of ethylene polymers comprising polymerizing ethylene or mixtures of ethylene and minor amounts of higher mono-olefin containing 3 to 20 carbon atoms per molecule under suitable reaction conditions in the presence of a catalyst comprising a solid particulate catalyst produced by reacting in liquid reactants which allows the recovery of a solid particulate material

(1) a vanadium compound havng a V-X linkage where X is halogen,
(2) at least one metal halide selected from the group consisting of aluminum trichloride, aluminum tribromide, boron trichloride, silicon tetrachloride, tin tetrachloride, and antimony pentachloride and
(3) an organophosphorus compound having a P-L linkage wherein L is selected from the group consisting of alkyl radicals, alkoxy radicals, aryl radicals, aryloxy radicals, cycloalkyl radicals, cycloalkoxy radicals, cycloalkylaryl radicals, alkylamino radicals, and haloalkoxy radicals, or
(4) reacting a metal halide compound as defined in (2) and vanadium organophosphate-containing functionality of the formula



wherein each L is individually selected from the group consisting of the L's as defined for (3), under conditions suitable for obtaining a particulate solid product, and
(5) combining said particulate product with an organoaluminum cocatalyst compound having the formula $AlR^1{}_nX_{3-n}$ wherein X is halogen, each R^1 is individually selected from the group consisting of alkyl, aryl, cycloalkyl and alkoxy radicals, and n is a number from 1 to 3 to form an active solid catalyst.

4,507,450

PROCESS FOR PREPARING POLYOLEFIN

Genjiro Kakogawa; Masayoshi Hasuo; Yoshinori Suga, and Kazuhisa Kojima, all of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 25, 1977, Ser. No. 818,754
Claims priority, application Japan, Aug. 18, 1976, 51-98443; Mar. 23, 1977, 52-31782
Int. Cl.³ C08F *4/02, 10/06*
U.S. Cl. 526—128 **6 Claims**

1. A process for polymerizing an alpha-olefin having at least three carbon atoms comprising contacting said olefin with a catalyst prepared by mixing:
(A) an organoaluminum compound with
(B) a solid titanium containing composition, said solid titanium composition being prepared by
(1) reacting organomagnesium compound having the formula R—Mg—X wherein R is hydrocarbon and X is halogen, with a silanol of the formula $RnSi(OH)_{4-n}$ wherein n is 1, 2 or 3, at a molar ratio of hydroxyl groups to Mg—C bonds of 0.1/1 to 10/1,
(2) reacting the reaction product of (1) with a carboxylic acid ester at a molar ratio of ester to Mg of 0.01/1 to 10/1, and
(3) reacting the reaction product of (2) in a suitable solvent with a titanium tetrahalide at a molar ratio of Ti/Mg of 0.1/1 to 50/1, the amount of Ti in the composition (B) being 0.1 to 20 weight percent.

4,507,451

PROCESS FOR PREPARING BIMODAL AND MULTIMODAL POLYMERS OF CONJUGATED DIENES

Christian Freppel, Chamalieres, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Continuation of Ser. No. 363,413, Mar. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 251,976, Apr. 6, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,833
Claims priority, application France, Apr. 9, 1980, 80 08108
Int. Cl.³ C08F *5/54*
U.S. Cl. 526—136 **6 Claims**

1. A process of preparing a bimodal or multimodal homopolymer of a conjugated diene or a bimodal or multimodal copolymer of a conjugated diene with another conjugated diene or with a vinyl aromatic compound, consisting in polymerizing the monomer(s) in a reaction medium at a temperature of between 20° C. and 200° C. in the presence of a catalyst system formed of the reaction product of:
(a) an organic compound of a metal of group 3A of the periodic classification of elements of the Mendeleev Table having one of the following formulas:

$M^1M^3R^1R^2R^3R^4$

$M^2(M^3R^1R^2R^3R^4)_2$

$M^3R^1R^2R^3$

$M^1OM^3R^1R^2$

in which M^1 represents an alkali metal, M^2 represents an alkaline earth metal, M^3 represents a metal of group 3A, R^1, R^2, R^3 represent an alkyl or aralkyl radical and R^4 represents either an alkyl or aralkyl radical or a radical XB in which X represents an oxygen, sulfur or nitrogen atom and B represents an alkyl or aralkyl radical or a radical $M^3(R^5R^6)$ in which R^5, R^6 represent an alkyl or aralkyl radical,
with (b) at least one electron-donor compound containing at least one heteroatom selected from the group consisting of aprotic polar compounds, protic polar compounds and compounds formed of the reaction products of protic polar compounds with an alkali metal or with an alkaline earth metal,
characterized by
adding to the reaction medium during the course of the polymerization reaction, as a modifying agent which is not a polymerization initiator, a compound of a metal of groups 1B to 7B and 8 of the periodic classification of elements of the Mendeleev Table or a magnesium compound of the general formula $Mg(A)_2$ in which A represents an alkyl radical having from 1 to 10 carbon atoms or an alcoholate, phenate, beta-diketonate or carboxylate radical; said modifying agent being added in such amount that the molar ratio of the modifying agent to the organic compound of the metal of group 3A is between 0.01 and 20.

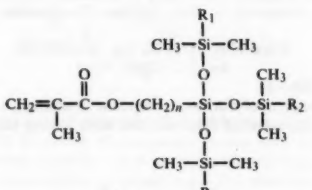
4,507,452

SILICONE HYDRIDE CONTACT LENS AND POLYMER

William M. Foley, Glendale, Calif., assignor to John D. McCarry, Anaheim, Calif.

Filed Mar. 8, 1984, Ser. No. 587,517
Int. Cl.³ C08F *30/08*
U.S. Cl. 526—279 **22 Claims**

1. Contact lenses comprising polymers resulting from the polymerization or copolymerization of:



wherein n is a positive integer from 1 to 6 and R_1, R_2, and R_3 are hydrogen or methyl, at least one of R_1, R_2 and R_3 being hydrogen.

4,507,453

DICYCLOPENTADIENE THERMOSET POLYMER

Glenn M. Tom, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 342,455, Jan. 25, 1982, abandoned. This application May 25, 1983, Ser. No. 497,918
Claims priority, application Canada, Jan. 6, 1983, 419034
Int. Cl.³ C08F 132/08
U.S. Cl. 526—283 **2 Claims**

1. A method of mold forming substantially cross-linked thermoset homopolymer product comprising polymerized units of dicyclopentadiene from dicyclopentadiene monomer comprising:

(a) providing a mold means having a polymerization chamber;

(b) providing a polymerization solution comprising dicyclopentadiene monomer, activator and catalyst, said dicyclopentadiene comprising a substantial majority on a weight percent basis of said polymerization solution;

(c) polymerizing in about 0.5 minute said polymerization solution in said polymerization chamber of said mold means to form a substantially cross-linked homopolymer product comprising polymerized units of dicyclopentadiene, said crosslinking being effective to characterize said homopolymer as having a flexural modulus of at least 150,000 psi at ambient temperature, a notched Izod impact strength of at least about 1.5 ft. lb./in. notch, and a percent gel swell, determined after the polymer is immersed in toluene for two hours at 100° C. of less than about 200%, said homopolymer product having substantially the form of said reaction chamber.

4,507,454

ACRYLIC POLYMERS SOLUTIONS FOR USE IN FORMING A MEMBRANE FOR CURING CONCRETE AND THE LIKE

Thomas W. Hutton, Doylestown, and Joseph A. Lavelle, Bethlehem, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 795,601, May 10, 1977, Pat. No. 4,225,651. This application Apr. 4, 1980, Ser. No. 137,211
Int. Cl.³ C08F 212/08, 220/16, 220/64
U.S. Cl. 526—317 **5 Claims**

1. A composition of matter, an addition polymer of about 10 to 50 percent by weight of an ester of acrylic or methacrylic acid, the alcohol moiety of which has from 12 to about 20 carbon atoms, about 40 to 89.5 percent by weight of a vinyl aromatic monomer, and about 0.5 to 5% percent by weight of a copolymerizable ethylenically unsaturated carboxylic acid or vinyl sulfonic acid, or salt thereof, said composition being in the form of an organic solvent solution of said addition polymer.

4,507,455

SILICONES BEARING ACYLATED DIAMINOHYDROCARBYL RADICALS AND METHOD THEREFOR

Thomas J. Tangney, and Maris J. Ziemelis, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 11, 1984, Ser. No. 609,380
Int. Cl.³ C08G 77/04
U.S. Cl. 528—26 **33 Claims**

1. An organopolysiloxane compound containing at least one siloxane unit selected from siloxane units having the formulae

$$ZNQ'NQSiO_{(3-a)/2} \text{ and } ZNQ'\overset{\oplus}{N}H_2QSiO_{(3-a)/2},$$
$$\begin{matrix} | & | & | \\ A & A & R'_a \end{matrix} \qquad \begin{matrix} | & | \\ A & OA \\ & \ominus \end{matrix} \quad \begin{matrix} | \\ R'_a \end{matrix}$$

all other siloxane units in the organopolysiloxane compound being selected from siloxane units have the formulae

$$ZNQ'NHQSiO_{(3-a)/2} \text{ and } R'_bSiO_{(4-b)/2}$$
$$\begin{matrix} | \\ A \end{matrix} \qquad \begin{matrix} | \\ R'_a \end{matrix}$$

wherein, at each occurrence, Z denotes H or R'', R'' denotes a monovalent hydrocarbon radical, R' denotes a monovalent radical selected from hydrocarbon radicals, halogenated hydrocarbon radicals, hydrogen atoms, —OR'' radicals, —OH radicals and —OA radicals, Q and Q' each denote a divalent hydrocarbon radical, A denotes an acyl radical having the formula

$$\begin{matrix} | \\ RC{=}O, \end{matrix}$$

R denotes a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical, a has a value of 0, 1 or 2 and b has a value of 0, 1, 2 or 3.

15. A process for preparing an organopolysiloxane compound containing at least one siloxane unit selected from siloxane units having the formulae

$$ZNQ'NQSiO_{(3-a)/2} \text{ and } ZNQ'\overset{\oplus}{N}H_2QSiO_{(3-a)/2},$$
$$\begin{matrix} | & | & | \\ A & A & R'_a \end{matrix} \qquad \begin{matrix} | & | \\ A & OA \\ & \ominus \end{matrix} \quad \begin{matrix} | \\ R'_a \end{matrix}$$

all other siloxane units in the organopolysiloxane compound being selected from siloxane units have the formulae

$$ZNQ'NHQSiO_{(3-a)/2} \text{ and } R'_bSiO_{(4-b)/2},$$
$$\begin{matrix} | \\ A \end{matrix} \qquad \begin{matrix} | \\ R'_a \end{matrix}$$

said process comprising:

(I) mixing components comprising

(i) an amine-containing organopolysiloxane compound containing at least one siloxane unit having the formula

$$ZNQ'NHQSiO_{(3-a)/2},$$
$$\begin{matrix} | \\ Y \end{matrix} \qquad \begin{matrix} | \\ R'_a \end{matrix}$$

all other siloxane units in the amine-containing organopolysiloxane compound having the formula $R'_bSiO_{(4-b)/2}$ and

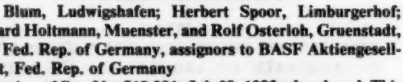
(ii) a monocarboxylic acid anhydride having the formula A_2O, the amounts of component (i) and component (ii) being sufficient to provide at least one mol of component (ii) for every mol of component (i) and for every siloxane unit, exceeding one, having the formula

$$ZNQ'NHQSiO_{(3-a)/2}$$
$$\begin{matrix} | \\ H \end{matrix} \qquad \begin{matrix} | \\ R'_a \end{matrix}$$

in the average molecule of component (i) wherein, at each occurrence, Z denotes H or R'', R'' denotes a monovalent hydrocarbon radical, R' denotes a monovalent radical selected from hydrocarbon radicals, halogenated hydrocarbon radicals, hydrogen atoms, —OR'' radicals, —OH radicals and —OA radicals, Q and Q' each denote a divalent hydrocarbon radical, A denotes an acyl radical having the formula

R denotes a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical, Y denotes H or A, a has a value of 0, 1 or 2 and b has a value of 0, 1, 2 or 3, and

(II) maintaining the mixture of (I) at a temperature of from 0° C. to 300° C. for a length of time sufficient for the formation of at least one siloxane unit selected from siloxane units having the formulae



4,507,456

HEAT-SETTING MIXTURES OF A POLYISOCYANATE WITH A POLYOL WHICH HAVE A LONG SHELF LIFE, AND THEIR PREPARATION

Rainer Blum, Ludwigshafen; Herbert Spoor, Limburgerhof; Gerhard Holtmann, Muenster, and Rolf Osterloh, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 518,001, Jul. 28, 1983, abandoned. This application Feb. 21, 1984, Ser. No. 581,905

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1982, 3228670; Jul. 31, 1982, 3228724

Int. Cl.³ C08G *18/80, 18/32, 18/34*

U.S. Cl. 528—45 4 Claims

1. A heat-setting mixture which has a long shelf life at room temperature, comprising a polyisocyanate and a polyol which may or may not contain additives, such as protective colloids, inert solvents, plasticizers, pigments, fillers, dyes or other assistants conventionally used in surface coating technology, wherein the polyisocyanate, in the form of discrete particles having a diameter of from 0.1 to 150 μm, is dispersed in the polyol, which may or may not contain the stated additives, and the polyisocyanate particles are deactivated at their surface, with the proviso that from 0.01 to 20 equivalent percent of the total amount of isocyanate groups present are deactivated by the addition of a compound containing carboxyl, phenolic hydroxyl, amide or hydrazide groups.

4,507,457

PRODUCTION OF MAGNETIC RECORDING MEDIA

Albert Kohl, Weisenheim; Norbert Schneider, Altrip; Gregor Ley, Wattenheim; Werner Balz, Limburgerhof; Milena Melzer, Ludwigshafen, and Helmut Jakusch, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 23, 1983, Ser. No. 525,621

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232117

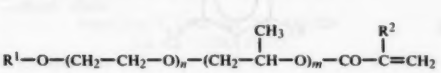
Int. Cl.³ H01F *10/02*

U.S. Cl. 427—48 4 Claims

1. A process for the production of a magnetic recording medium by dispersing finely divided anisotropic magnetic material and conventional additives in a solution of a polymeric binder in an organic solvent or an aqueous dispersion of a polymeric binder, applying the dispersion, in the form of a layer, to a non-magnetizable base, orienting the anisotropic magnetic material by means of a magnetic field and then drying the applied layer, wherein the dispersant in an amount of from 0.5 to 5% by weight based on the amount of magnetic material added is a copolymer which contains, as characteristic monomers,

(a) from 80 to 2% by weight of an ethylenically unsaturated C_3–C_5-carboxylic acid, acrylamidodimethyl-propanesulfonic acid, vinylsulfonic acid, vinylphosphoric acid or a mixture of the said monomers, and

(b) from 20 to 98% by weight of a polymerizable ethylenically unsaturated compound of the formula



wherein R^1 is alkyl of 1 to 20 carbon atoms or unsubstituted or C_1-C_{12}-alkyl-substituted phenyl, R^2 is H or $-CH_3$, n is 2 to 100 and m is 0 to 50.

4,507,458

URETHANE ACRYLATE COMPOSITIONS

Hiroyuki Shiraki, Kobe, and Tetsuro Abe, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 27, 1984, Ser. No. 594,480

Claims priority, application Japan, Apr. 14, 1983, 58-66627; Feb. 9, 1984, 59-23937

Int. Cl.³ C08G *18/32*

U.S. Cl. 528—49 10 Claims

1. A urethane acrylate resin obtained by reacting a polyisocyanate with a polyester polyol having a molecular weight of 500 to 3,000, a low-molecular-weight polyol having a molecular weight of 60 to 400 and a hydroxyalkyl acrylate containing at least 70 mole % of a monohydroxyalkyl acrylate at an NCO-/OH equivalent ratio in the range of 0.7 to 1.20.

4,507,459

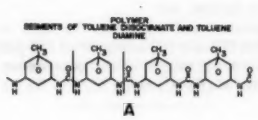
POLYURETHANE COMPOSITIONS HAVING LOW HYSTERESIS

Andreas R. Schmidt, Reinach, Switzerland; Herbert F. Strohmayer, Allentown, Pa.; Walter Sibral, Tulln, Austria, and Barton Milligan, Coplay, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

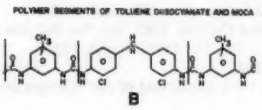
Filed Feb. 8, 1984, Ser. No. 578,240

Int. Cl.³ C08G *18/10, 18/32*

U.S. Cl. 528—64 18 Claims



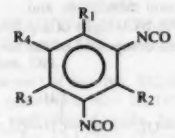
A



B

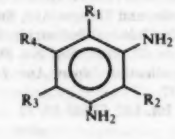
1. In a urethane composition formed by reacting a prepolymer having an excess of isocyanate groups with an aromatic diamine chain extender and then curing the resulting composition, the improvement for producing a polyurethane composition having low hysteresis which comprises reacting:

(A) a prepolymer formed by the reaction of (1) an aromatic polyisocyanate represented by the formula:



where R_1 R_2 R_3 R_4 represents H, alkyl from C_{1-4} atoms, CN, halogen, CO_2 R_5, COR_6R_7 where R_5 represents alkyl of C_{1-6} atoms and R_6 R_7 represents alkyl of C_{1-6} atoms and H, and (2) a polyol of about about 500–5000 molecular weight of which at least 90% of the polyol is difunctional in a quantity sufficient to provide from about 2 to 10% molar excess isocyanate groups in said prepolymer; with,

(B) a chain extender mix comprising an aromatic diamine represented by the formula:



where R_1 R_2 R_3 R_4 represents H, alkyl from C_{1-4} atom, CN halogen, CO_2 R_5, COR_6R_7 where R_5 represents alkyl of C_{1-6} atoms and R_6 R_7 represents alkyl of C_{1-6} atoms and H, and (2) a polyol of about about 500–5000 molecular weight of which at least 90% of the polyol is difunctional, said diamine being present in said chain extender mix in a proportion to provide from 0.5 to 5 equivalent amine per equivalent polyol; and then, curing the resulting reaction product.

4,507,460

EPOXY RESIN COMPOSITION

Toru Kikuchi; Takayuki Saito; Akihiro Kobayashi, and Hitoshi Goto, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,556
Claims priority, application Japan, Sep. 21, 1982, 57-164423
Int. Cl.³ C08G *59/42*
U.S. Cl. 525—507 **17 Claims**

1. An epoxy resin composition comprising

(A) an epoxy resin,

(B) an alicyclic or aromatic polycarboxylic acid anhydride or mixture thereof, and

(C) 4-ketopimelic acid dilactone; the total weight of the components (B) and (C) being 30 to 150 parts by weight per 100 parts by weight of the component (A) and the weight ratio of (B)/(C) being 95/5 to 30/70.

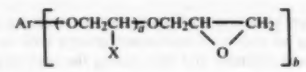
4,507,461

LOW VISCOSITY EPOXY RESINS

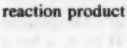
W. Raymond Bowditch, West Chester, Pa., assignor to Wilmington Chemical Corporation, Wilmington, Del.

Filed Oct. 14, 1983, Ser. No. 541,954
Int. Cl.³ C08G *59/02, 59/24*
U.S. Cl. 528—104 **7 Claims**

1. An epoxy resin comprised of the reaction product of:



wherein Ar is an aromatic residue, a is 1 to 2, b is at least 2 and x is —CH_3, —H, or —CH_2—CH_3, and a polyfunctional phenolic hydroxy compound represented by the structural formula:



wherein Ar is an aromatic residue and m is at least 2, said reaction product being at least difunctional.

4,507,462

LOW MOLECULAR WEIGHT AROMATIC POLYMERS WITH BIPHENYLENE END GROUPS

John K. Stille, Fort Collins, Colo., assignor to Polymer Science, New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,139
Int. Cl.³ C08G *12/00*
U.S. Cl. 528—125 **21 Claims**

1. A process for preparing biphenylene end-capped low molecular weight thermally stable aromatic polyquinoline polymers which comprises carrying out a misbalanced polymerization reaction of a suitable aromatic aminoketone and a suitable aromatic ketomethylene compound, wherein there is a molar excess of the aminoketone as compared to ketomethylene compound, and thereafter adding a monofunctional biphenylene compound.

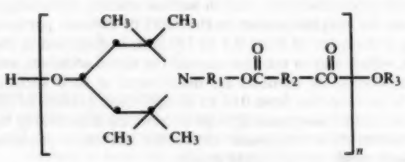
4,507,463

PROCESS FOR PRODUCING POLYESTERS FROM ALIPHATIC DICARBOXYLIC ACIDS AND POLYALKYLPIPERIDYLDIOLS

Ivan Orban, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

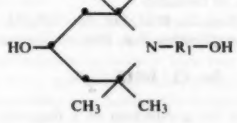
Filed May 1, 1984, Ser. No 606,077
Claims priority, application Switzerland, May 11, 1983, 2591/83; Jun. 27, 1983, 3495/83
Int. Cl.³ C08G *63/34*
U.S. Cl. 528—279 **6 Claims**

1. A process for producing a compound of the formula I



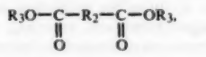
(I)

wherein n is a number between 18 and 25, R_1 and R_2 independently of one another are C_1–C_{18}-alkylene, C_2–C_{18}-alkylene interrupted by —O—, —S— or —N(R)—, where R is hydrogen or C_1–C_4-alkyl, or are C_4–C_8-alkenylene, and R_3 is C_1–C_4-alkyl, by polycondensation of a diol of the formula II



(II)

with a dicarboxylic acid ester of the formula III



(III)

in the molar ratio of about 1:1, in a suitable solvent, which process comprises treating the reaction medium, in the presence of at least 0.05 mol %, relative to the diol of the formula II, of an organometallic compound of titanium or tin, at a maximum steam temperature of 75° C., until the formed metha-

nol has been almost completely distilled off; then continuing distillation for at least 3 hours, during which time the volume of the reaction solution is kept approximately constant by successive additions of solvent, at a steam temperature of between 100° and 145° C.; subsequently concentrating the reaction solution by evaporation; and finally grinding the resulting melt after solidification.

4,507,464

POLYISOCYANATES PREPARED BY PHOSGENATING A POLYAMINE IN THE PRESENCE OF A COMPOUND CONTAINING AT LEAST ONE HYDROXYL GROUP

Werner Rasshofer, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 10, 1984, Ser. No. 578,911

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306845

Int. Cl.³ C08G *18/10*

U.S. Cl. 528—288 **20 Claims**

1. A process for the production of polyisocyanates comprising phosgenating a primary polyamine in the presence of a compound containing at least one primary and/or secondary alcoholic hydroxyl group selected from the group consisting of:

(a) alkane polyols free from ether and ester groups having a molecular weight of from 62 to 250,

(b) cycloalkane polyols free from ether and ester groups having a molecular weight of from 116 to 250,

(c) polyols containing ether groups having a molecular weight of from 106 to 10,000 provided that when the polyamine is an aromatic polyamine the polyol containing ether groups is a polypropylene glycol and

(d) mixtures thereof,

in a manner such that an equivalent ratio of primary amino groups to hydroxyl groups of from 1:0.005 to 1:0.99 is maintained during the phosgenation.

4,507,465

PROCESS FOR PRODUCING LACTAM/POLYOL BLOCK COPOLYMER

Kazumasa Chiba; Kazuhiko Kobayashi, both of Nagoya, and Tosaku Susuki, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,624

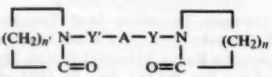
Claims priority, application Japan, Dec. 29, 1982, 57-231985; Apr. 26, 1983, 58-73465

Int. Cl.³ C08G *69/20*

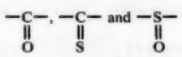
U.S. Cl. 528—312 **21 Claims**

1. A process for producing a moldable lactam-polyol block copolymer which comprises polymerizing a mixture comprising substantially from about 50 to about 95 parts by weight of lactam and from about 50 to about 5 parts by weight of polyol in contact with a catalyst for anionic polymerization and an activator represented by the following formula (I);

(I)



wherein A denotes a bifunctional organic residue having at least one kind of heteroatom selected from the group consisting of N, O, S, F, Cl, Br and I, and Y and Y′ denote an acyl group selected from the group consisting of



respectively, and n and n′ denote an integer from 3 to 11.

4,507,466

DENSE STAR POLYMERS HAVING CORE, CORE BRANCHES, TERMINAL GROUPS

Donald A. Tomalia, Midland, and James R. Dewald, Bay City, both of Mich., assignors to The Dow Chemical Corporation, Midland, Mich.

Filed Jan. 7, 1983, Ser. No. 456,226

Int. Cl.³ C08G *69/00*

U.S. Cl. 528—332 **14 Claims**

1. A dense star polymer having at least one core branch emanating from a core, each core branch having at least one terminal group and amidoamine linkages provided that (1) the ratio of terminal groups to the branches emanating from the core is two or greater, (2) the density of terminal groups in the polymer is at least 1.5 times that of a conventional star polymer having a comparable molecular weight and number of core branches, each of such branches of the conventional star polymer bearing only one terminal group, and (3) a molecular volume that is no greater than 60 percent of the molecular volume of said conventional star polymer.

4,507,467

WHOLLY AROMATIC HALOGENATED POLYAMIDE FIBER AND FILM

Keizo Shimada; Hideharu Sasaki; Hiroshi Mera; Toru Sawaki, and Akihiro Aoki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

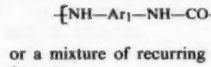
Continuation of Ser. No. 290,166, Aug. 5, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,377

Claims priority, application Japan, Aug. 7, 1980, 55-107749

Int. Cl.³ C08G *69/32*

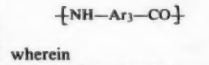
U.S. Cl. 528—348 **6 Claims**

1. A shaped article in the form of a fiber having a tensile modulus of from 700 to approximately 2,000g/d at room temperature or a film having a tensile modulus from 1,800 to approximately 5,000 kg/mm² at room temperature, said shaped article comprising a wholly aromatic copolyamide copolymer consisting of recurring units of the formula:



(A)

or a mixture of recurring units of the formula (A) and the formula:



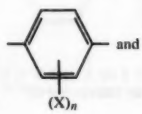
(B)

wherein

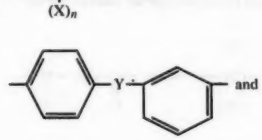
Ar_1 independently represents divalent aromatic hydrocarbon ring residues selected from the group consisting of

(a)

(b)



(c)



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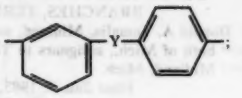
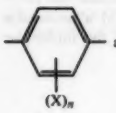


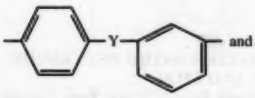
Ar_2 independently represents divalent aromatic hydrocarbon ring residues selected from the group consisting of

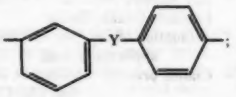
(a)

(b)



(c)

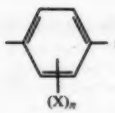




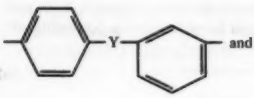
Ar_3 independently represents divalent aromatic hydrocarbon ring residues selected from the group consisting of

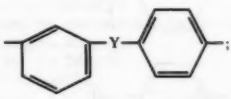
(a)

(b)

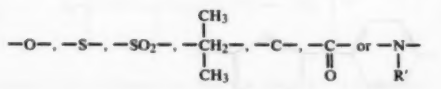


(c)





wherein X is halo, n is an integer of from 1 or 3, and Y is a divalent radical selected from the group consisting of



wherein R' represents an alkyl group having up to 5 carbon atoms, wherein the molar ratio of the aromatic residues of Ar_1, Ar_2 and Ar_3 fall within the region formed by connecting points P, Q, R and S in order, through straight lines in the triangular coordinate of FIG. 1 attached hereto, said wholly aromatic copolyamide having an intrinsic viscosity of at least 1.5 as measured on a solution containing 0.5 g of the copolyamide in 100 ml of concentrated sulfuric acid at 30° C.

4,507,468

METHOD FOR PURIFYING POLYPHENYLENE SULFIDE

Juheiji Kawabata, Sakai; Toshio Inoue, Izumiohtsu; Toshinori Sugie, Takaishi, and Fumihiro Kobata, Izumi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jul. 14, 1983, Ser. No. 513,659

Claims priority, application Japan, Jul. 16, 1982, 57-123001; May 26, 1983, 58-93048; May 27, 1983, 58-93405

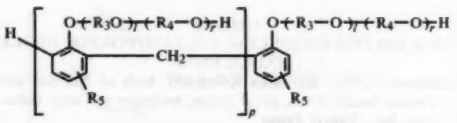
Int. Cl.³ C08G 75/14

U.S. Cl. 528—388 **15 Claims**

1. A method for purifying polyphenylene sulfide containing impurities mainly comprising an inorganic electrolytic component, which comprises heat-treating at a temperature of 150° C. to 350° C. said polyphenylene sulfide in an organic solvent in the presence of an oxyalkylene compound which is selected from the group consisting of a compound represented by the general formula

$$RO\text{-}(R_1O)_n(R_2O)_mH$$

wherein R represents a hydrogen atom, an alkyl group having 1 to 40 carbon atoms, or an aryl group having 6 to 50 carbon atoms, and R_1 and R_2 represent an alkylene group having 2 to 4 carbon atoms, and n and m are 0 or integers of at least 1 provided that the sum of n and m is at least 1, and a compound represented by the general formula



wherein R_3 and R_4 represent an alkylene group having 2 to 4 carbon atoms, R_5 represents a hydrogen atom, an alkyl group having 1 to 30 carbon atoms or an aryl group, l and r are 0 or integers of up to 90 provided that the sum of l and r is an integer of 1 to 90, and p is an integer of 2 to 50, the amount of the oxyalkylene compound being 0.01 to 200% by weight based on said polyphenylene sulfide containing said impurities, thereby to reduce the amount of said impurities.

4,507,469

CURABLE COMPOSITION COMPRISING POLYETHER HAVING SILYL GROUP

Tetsuo Mita; Hirotazu Nakanishi; Junji Takase; Katsuhiko Isayama, and Nobutaka Tani, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 392,561, Jun. 28, 1982, abandoned, which is a continuation of Ser. No. 210,315, Nov. 25, 1980, abandoned, and a continuation of Ser. No. 055,144, Jul. 6, 1979, abandoned. This application Nov. 8, 1983, Ser. No. 524,029

Claims priority, application Japan, Jul. 7, 1978, 53/83283

Int. Cl.³ C08G 65/00

U.S. Cl. 528—425 **2 Claims**

1. A curable composition comprising a mixture consisting essentially of

100 parts by weight of a polymer having a polyether as a main chain and containing a silyl group having the formula:

$$-SiX_{3-a}^{R_a}$$

wherein a is an integer of 0, 1, or 2, R is a monovalent hydrogen group and X is a hydrolyzable group selected from the group consisting of hydride, alkoxyl, acyloxy, ketoximato, aminoxy, and amide groups;

0.01 to 10 parts by weight of a catalyst selected from the group consisting of tin (II) salt of an organic carboxylic acid, lead (II) salt of an organic carboxylic acid, and mixtures thereof; and

0.001 to 10 parts by weight of a member selected from the group consisting of an organic carboxylic acid, an organic amine, and mixtures thereof, said organic carboxylic acid and said organic amine having 1 to 20 carbon atoms;

wherein said organic carboxylic acid is selected from the group consisting of acetic acid, propionic acid, caproic acid, caprylic acid, capric acid, lauric acid, oleic acid, naphthenic acid, stearic acid, oxalic acid, citric acid, chloroacetic acid, acrylic acid, methacrylic acid, m-nitrobenzoic acid and p-nitrobenzoic acid;

wherein said organic amine is selected from the group consisting of diethylenetriamine, triethylenetetramine, tetraethylenepentamine, butyl amine, hexylamine, octylamine, decylamine, laurylamine, hexamethylenediamine, triethanolamine, diethanolamine, N,N,N',N'-tetramethyl-1, 3-butanediamine, benzylamine, cyclohexylamine, dodecamethylenediamine, dimethylethylenediamine, dimethylaminoethanol, N,N,N',N'-tetramethylethylenediamine, triethylamine, N,N-dimethylaniline and dimethylbenzylamine; and

wherein said tin (II) salt is selected from the group consisting of tin (II) hexanoate, tin (II) 2-ethyl hexanoate, tin (II) naphthenate, tin (II) decanoate, tin (II) stearate, tin (II) laurate, and tin (II) oleate; and wherein said lead (II) salt is selected from the group consisting of lead (II) 2-ethyl hexanoate, lead (II) octylate, lead (II) hexanoate, lead (II) decanoate, lead (II) stearate, lead (II) laurate, lead (II) oleate and lead (II) naphthenate; said composition cures upon exposure to moisture to form a rubber like substance having improved set resistance.

4,507,470
METHOD OF RAPIDLY DISSOLVING POLYMERS IN WATER

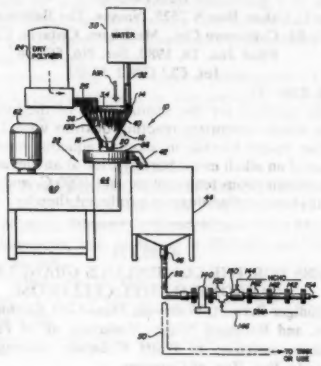
Edwin T. Sortwell, Wheaton; Manuel Slovinsky, Woodridge, and Alan R. Mikkelsen, Downers Grove, all of Ill., assignors to Diatec Polymers, Batavia, Ill.

Filed Mar. 29, 1984, Ser. No. 594,559
Int. Cl.³ C08C *1/00*
U.S. Cl. 528—499 **33 Claims**

1. A method of rapidly dissolving particles of a water soluble polymer in water, comprising the steps of:

(a) contacting said particles with water to form a suspension of said particles in water; and,

(b) simultaneously with or immediately after formation of said suspension subjecting said suspension to instantaneous and momentary conditions of high shear in order to finely divide said particles, said shear conditions and the proportion of said water to said polymer in said suspension being selected to avoid molecular degradation of said polymer,



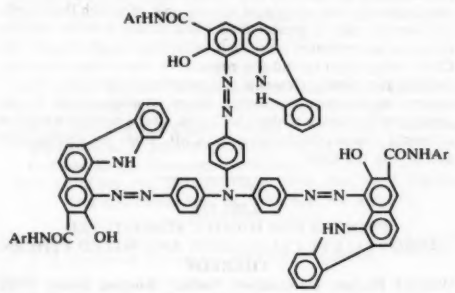
whereby at least a portion of said particles are dissolved in said water.

4,507,471
TRISAZO COMPOUNDS PREPARED FROM 4,4',4''-TRIAMINOTRIPHENYLAMINE AND 2-HYDROXY-3-PHENYLCARBAMOYLBENZO[A]CARBAZOLE DERIVATIVES

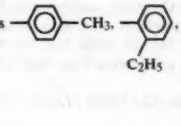
Masafumi Ohta, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

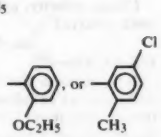
Filed May 19, 1982, Ser. No. 379,688
Claims priority, application Japan, May 28, 1981, 56-80151; May 28, 1981, 56-80161; Jun. 10, 1981, 56-88102; Jun. 10, 1981, 56-88111; Jun. 12, 1981, 56-90611; Jan. 18, 1982, 57-5682
Int. Cl.³ C07C *107/00, 107/04;* C09B *35/378;* G03G *5/06*
U.S. Cl. 534—755 **5 Claims**

1. A trisazo compound having the formula:



wherein Ar represents





4,507,472

MANUFACTURE OF DIETHYLAMINOETHYL DEXTRANS

Thomas C. Usher, Box N 7525, Nassau, The Bahamas, and Natu Patel, 54, Cottsmore Cre., Muskham, Ontario, Canada

Filed Jun. 14, 1983, Ser. No. 504,367

Int. Cl.³ C08B *37/02*

U.S. Cl. 536—51 **5 Claims**

1. The method for the manufacture of diethylaminoethyl dextran which comprises reacting dextran with 2-chlorotriethylamine hydrochloride in alkaline aqueous medium in the presence of an alkali metal borohydride at an elevated temperature between room temperature and 100° C. and recovering the diethylaminoethyl dextran produced thereby.

4,507,473

PROCESS FOR THE CONTINUOUS GRANULATION OF CARBOXYMETHYL CELLULOSE

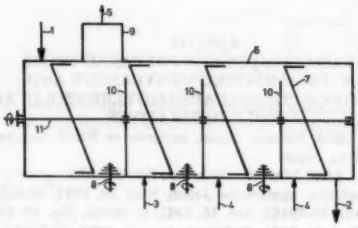
Claus-Rüdiger Bernert, Walsrode; Hans-Gert Kirchner, Fallingbostel, and Reinhard Näder, Walsrode, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,737

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308420

Int. Cl.³ C08B *11/20*

U.S. Cl. 536—86 **3 Claims**



1. A continuous process for the granulation of alcohol and water-moist carboxymethyl cellulose (CMC), which comprises continuously introducing CMC still moist with adhering aqueous alcohol into an elongated stirring unit, of which the length-to-diameter ratio is greater than 1 and in which radial stirring elements are mounted on a shaft extending longitudinally, the CMC being taken up and size reduced by the stirring elements, rotating the stirring elements at a peripheral speed of at least 2 m/sec., simultaneously passing steam countercurrent to the direction of advance of the CMC; and, after a residence time of at least 1 minute, discharging the CMC from the stirring unit and drying the CMC.

4,507,474

PROCESS FOR HIGHLY SUBSTITUTED CARBOXYALKYL CELLULOSES AND MIXED ETHERS THEREOF

Wilfried Raehse, Duesseldorf; Norbert Kuehne, Haan; Willi Wuest, Ratingen, and Konrad Engelskirchen, Meerbusch, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,164

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303153

Int. Cl.³ C08B *11/193, 11/00*

U.S. Cl. 536—97 **22 Claims**

1. A process for the preparation of a highly substituted carboxyalkyl cellulose having an average degree of substitution of from about 1.0 to about 2.8, and optionally mixed ethers thereof having a mean overall degree of substitution of greater than 1, comprising two or three reaction stages wherein each reaction stage is carried out by treating a suspension of finely divided cellulose in an organic suspending agent with no greater than about 5 moles, per mole of anhydroglucose unit present in the cellulose, of an alkalizing agent, followed by etherification of the alkalized product with no greater than about 2.5 moles, per mole of anhydroglucose unit, of a carboxyalkylating agent, optionally accompanied, preceded, or followed by reaction with at least one additional etherifying agent, wherein each successive reaction stage is carried out on the reaction mixture of the preceding reaction stage without intermediate purification of the reaction product contained therein, and wherein the total water content of the system prior to the last treatment with a carboxyalkylating agent is no greater than about 450% by weight, based on the weight of finely divided cellulose initially used in the process.

4,507,475

PROCESS FOR PURIFICATION OF CRUDE POLYETHER POLYOLS

Wolfgang Straehle, Heidelberg; Raymond Denni, Wachenheim, and Matthias Marx, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,330

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229216

Int. Cl.³ C07H *15/04*; C07C *41/34*

U.S. Cl. 536—120 **9 Claims**

1. A process for the purification of crude polyether polyols prepared by anionic polymerization of alkylene oxides in the presence of basic catalysts and subsequent neutralization of the catalysts with mineral acid wherein the

(a) crude polyether polyol is mixed with 0.2 to 1.5 parts by weight of water per 100 parts by weight of crude polyether polyol, and 0.3 to 1.1 moles of ortho-phosphoric acid per mole of alkaline catalyst,

(b) 0.05 to 0.5 parts by weight of an adsorption agent per 100 parts by weight of crude polyether polyol are subsequently incorporated in the reaction mixture,

(c) the resultant salts and solid additives are separated, and

(d) the water is removed from the polyether polyol.

4,507,476

ANTHRAQUINONE DYESTUFFS FOR CELLULOSE-CONTAINING FIBERS

Toshio Niwa; Kiyoshi Himeno, and Toshio Hihara, all of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

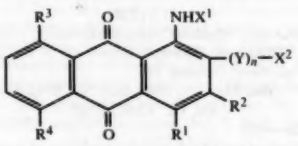
Filed Jan. 5, 1984, Ser. No. 568,340

Claims priority, application Japan, Feb. 4, 1983, 58-17206

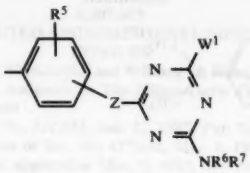
Int. Cl.³ C07D *251/42, 251/48*

U.S. Cl. 544—187 **12 Claims**

1. An anthraquinone dyestuff for cellulose-containing fibers which is of the formula:



wherein R^1 represents amino or hydroxyl, R^2 represents hydrogen, chlorine, bromine, cyano or $—SO_2R$ wherein R represents methyl, ethyl or phenyl, R^3 and R^4 each represents hydrogen, amino, hydroxyl, nitro, chlorine or bromine, Y represents a connecting group consisting of —O— or —S—, one of X^1 and X^2 is hydrogen and the other is a group of the formula:



wherein —Z— represents a connecting group consisting of —O— or —S—, —W^1 represents phenyl or —NR^6R^7, R^5 represents hydrogen, methyl, ethyl, methoxy, ethoxy, chlorine or bromine, R^6 and R^7 each represents hydrogen or alkyl, alkenyl, cyclohexyl, aryl or aralkyl which may optionally be substituted by lower alkoxy, or NR^6R^7 represents a 5-membered or 6-membered nitrogen-containing heterocyclic ring formed by combination of R^6 and R^7, and n is 0 or 1, with the proviso that where X^2 is hydrogen, n is 0.

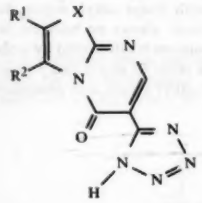
4,507,477

PROCESS FOR TETRAZOLYL-PYRIMIDINONE DERIVATIVES

James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Sep. 9, 1982, Ser. No. 416,272
Int. Cl.³ C07D *498/04, 513/04*
U.S. Cl. 544—250 **6 Claims**

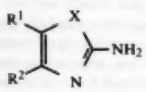
1. A process for the preparation of a compound of the formula



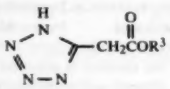
wherein X is sulfur or oxygen and R^1 and R^2 are independently selected from the group consisting of H and an alkyl group containing 1 to about 4 carbon atoms, or R^1 and R^2 are fused to form an unsubstituted benzene ring or a substituted benzene ring having one or more substituents independently from the group consisting of an alkyl group containing 1 to about 4 carbon atoms, an alkoxy group containing 1 to about 4 carbon atoms, and halogen

comprising

(1) reacting together a heterocyclic amine of the formula



wherein X, R^1 and R^2 are as defined above, an alkyl tetrazol-5-ylacetate of the formula



wherein R^3 is an alkyl group containing 1 to about 4 carbon atoms, and a trialkyl orthoformate of the formula

$HC(OR^4)_3$

wherein R^4 is an alkyl group containing 1 to about 4 carbon atoms, in the presence of a Lewis acid to provide a 2-(N-heterocyclyl)-amino-1-(1H-tetrazol-5-yl)acrylate ester, and

(2) condensing the 2-(N-heterocyclyl)amino-1-(1H-tetrazol-5-yl)acrylate ester in the presence of polyphosphoric acid.

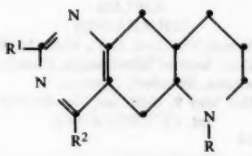
4,507,478

2-MERCAPTOPYRIMIDOHEXAHYDROQUINOLINES AND RELATED COMPOUNDS

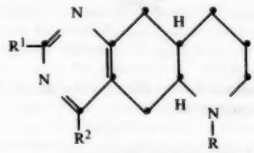
Cynthia L. Nichols; Edmund C. Kornfeld, and John M. Schaus, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 26, 1983, Ser. No. 535,518
Int. Cl.³ C07D *487/17, 215/00;* **A61K** *7/42*
U.S. Cl. 544—250 **11 Claims**

1. A trans-(±) compound of the formula



or a trans-(−) compound of the formula



wherein R is C_1–C_3 alkyl, allyl, H or CN; R^1 is H, NH_2, SH, S-C_1–C_3 alkyl, OH or O-C_1–C_3 alkyl; R^2 is H, OH or NH_2 subject to the proviso that R^1 can only be NH_2 when R^2 is NH_2 or OH, and pharmaceutically-acceptable salts thereof.

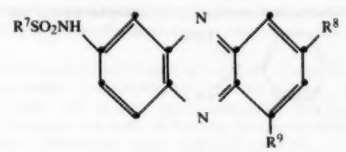
4,507,479

COLOR-FORMING SULFONAMIDODIPHENYLAMINE DYE PRECURSOR THAT PRODUCES PHENAZINE DYE

Rolf S. Gabrielsen, Webster; Patricia A. Graham, Williamson, and James E. Klijanowicz, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 280,628, Jul. 6, 1981, Pat. No. 4,380,666. This application Sep. 29, 1982, Ser. No. 426,576
Int. Cl.³ C07D *241/46*
U.S. Cl. 544—348 **7 Claims**

1. A phenazine dye represented by the formula:



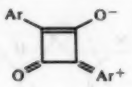
wherein:

R^7 is alkyl having 1 to 20 carbon atoms, phenyl, methoxyphenyl, triisopropylphenyl, tolyl, benzyl or xylyl;
R^8 is alkoxy having 1 to 20 carbon atoms, alkyl containing 1 to 20 carbon atoms, or

R^9 is hydrogen, alkyl having 1 to 4 carbon atoms or —NH-SO_2R^{12};
R^{10} is hydrogen or alkyl having 1 to 20 carbon atoms;
R^{11} is alkyl having 1 to 20 carbon atoms; and,
R^{12} is alkyl having 1 to 20 carbon atoms, phenyl, methoxyphenyl, triisopropylphenyl, tolyl, benzyl or xylyl.

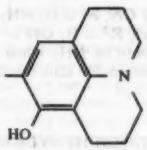
4,507,480
SQUARAINES
Anthony M. Horgan, Pittsford, N.Y.; Peter M. Kazmaier, and Richard A. Burt, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed May 9, 1983, Ser. No. 493,113
Int. Cl.³ C07D *455/04*
U.S. Cl. 546—94 **5 Claims**

1. A squaraine of the formula

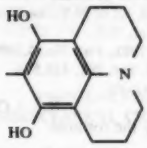


wherein Ar is selected from the moieties specified resulting in the following squaraines:

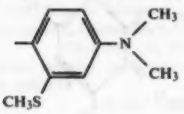
I. bis-9-(8-hydroxyjulolidinyl)squaraine



II. bis-9-(8,10-dihydroxyjulolidinyl)squaraine



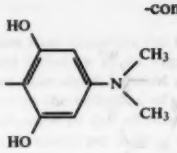
III. bis(4-dimethylamino-2-methylthiophenyl)squaraine



and

IV. bis(2,6-dihydroxy-4-dimethylaminophenyl)squaraine

-continued



4,507,481
PYRROLO[1,2-a]IMIDAZOLES AND IMIDAZO[1,2-a]PYRIDINES
Thomas A. Davidson, and Robert J. Murray, both of Penfield, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.
Filed Jul. 29, 1983, Ser. No. 518,514
Int. Cl.³ C07D *487/04*
U.S. Cl. 546—121 **4 Claims**

1. The compound selected from the group consisting of (a) a 2-phenyl, 3-phenyl and 2,3-diphenyl-2,5,6,7-tetrahydro-3H-pyrrolo[1,2-a]imidazole which is mono- or di-substituted at the 7-position with $—XR_1$ and (b) a 2-phenyl, 3-phenyl or 2,3-diphenyl-2,3,5,6,7,8-hexahydroimidazo[1,2-a]pyridine which is mono- or di-substituted at the 8-position with $—XR_1$, wherein X is 0 or S(0)n; n is 0, 1 or 2; R_1 is hydrogen, lower alkyl, phenyl, benzyl, or phenyl or benzyl substituted by lower alkyl, amino, lower alkylamino, nitro, halogen, hydroxy or lower alkoxy; the 2,3-position of said compound has a single or a double bond; the phenyl groups at the 2 and/or 3 positions are unsubstituted or substituted with lower alkyl, amino, lower alkylamino, nitro, hydroxy, lower alkoxy or halogen; in the case where one of the 2 or 3 positions is substituted by a phenyl or substituted phenyl, then the other of said 2 and 3 positions may be substituted by a lower alkyl group; and pharmaceutically acceptable salts thereof.

4,507,482
PURIFICATION OF MEFLOQUIN HYDROCHLORIDE
Helmut Bömches, Aesch, and Bruno Hardegger, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Apr. 4, 1983, Ser. No. 481,691
Claims priority, application Switzerland, Apr. 14, 1982, 2256/82
Int. Cl.³ C07D *403/02*
U.S. Cl. 546—176 **8 Claims**

1. A method for obtaining erythro-α-2-piperidyl-2,8-bis-(trifluoromethyl)-4-quinolinemethanol hydrochloride from mixtures of erythro- and threo-α-2-piperidyl-2,8-bis-(trifluoromethyl)-4-quinolinemethanol hydrochloride, which method comprises treating said mixtures with an aqueous alcohol, wherein the alcohol is selected from the group consisting of methanol, ethanol and isopropanol, and, thereafter, separating the erythro-α-2-piperidyl-2,8-bis-(trifluoromethyl)-4-quinolinemethanol hydrochloride.

8. Erythro-α-2-piperidyl-2,8-bis-trifluoromethyl-4-quinolinemethanol hydrochloride whose I. R. corresponds to FIG. 4, modification D, and is essentially free from the threo from, which is prepared by treating erythro-α-2-piperidyl-2,8-bis(trifluoromethyl)-4-quinolinemethanol hydrochloride, which is present at least partially in another form, with an alcohol/water mixture, wherein the alcohol is selected from the group consisting of methanol, ehtanol and isopropanol, and thereafter, separating the erythro-α-2-piperidyl-2,8-bis-(trifluoromethyl)-4-quinolinemethanol hydrochloride.

4,507,483
3-[(SUBSTITUTED-AMINO)(THIENYL)METHYL]-1H-INDOLES

Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 341,951, Jan. 22, 1982, Pat. No. 4,398,030, which is a division of Ser. No. 127,650, Mar. 6, 1980, Pat. No. 4,341,402. This application Mar. 9, 1983, Ser. No. 473,760
Int. Cl.[3] C07D *409/14, 409/06, 403/14;* B41M *5/16, 5/18, 5/22*
U.S. Cl. 546—201 1 Claim

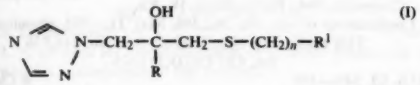
1. A compound selected from the group consisting of 3-[(dimethylamino)(2-thienyl)methyl]-1-ethyl-2-methyl-1H-indole, and 3-[(1-piperidinyl)(2-thienyl)methyl]-1-ethyl-2-methyl-1H-indole.

4,507,484
TRIAZOLE ANTIFUNGAL AGENTS

Geoffrey E. Gymer, and Kenneth Richardson, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

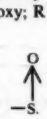
Filed May 31, 1983, Ser. No. 499,709
Claims priority, application United Kingdom, Jul. 24, 1982, 8221477
Int. Cl.[3] A01N *43/64, 43/40;* C07D *401/12, 249/08*
U.S. Cl. 546—210 19 Claims

1. A compound of the formula:



(I)

where R is a phenyl group optionally substituted by 1 to 3 substituents each independently selected from halo, CF_3, C_1–C_4 alkyl and C_1–C_4 alkoxy; R^1 is selected from (a)



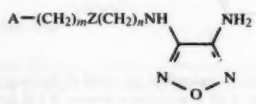
(C_1–C_4 alkyl), (b) $—SO_2(C_1–C_4$ alkyl), (c) $—SO_2NR^2R^3$ where either R^2 and R^3 are both C_1–C_4 alkyl, or R^2 and R^3 together with the N atom to which they are attached represent piperidino, (d) $—NHSO_2(C_1–C_4$ alkyl) and (e) $—CONR^4R^5$ where either R^4 is H or C_1–C_4 alkyl and R^5 is C_1–C_4 alkyl, or R^4 and R^5 together with the N atom to which they are attached represent piperidino; and n is 1 or 2; with the proviso that n is 2 when R^1 is $—NHSO_2(C_1–C_4$ alkyl);
or a pharmaceutically acceptable or agriculturally acceptable acid addition salt thereof.

4,507,485
3,4-DISUBSTITUTED-1,2,5-OXADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

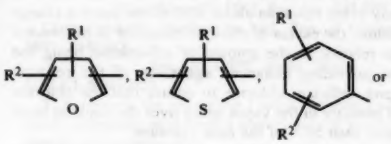
Ivo Monkovic, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 23, 1984, Ser. No. 573,258
Int. Cl.[3] C07D *271/08, 413/06, 413/12*
U.S. Cl. 546—210 7 Claims

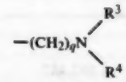
1. A compound of the formula



wherein
m is an integer of from 0 to 2 inclusive;
n is an integer of from 2 to 5 inclusive;
Z is oxygen, sulfur or methylene; and
A is



in which R^1 is hydrogen, (lower)alkyl, or (lower)alkoxy, and R^2 is



in which q is an integer of from 1 to 4 inclusive, and R^3 and R^4 each are independently, (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl; provided that R^3 and R^4 may not both be cyclo(lower)alkyl; or R^3 and R^4, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, or 3-azabicyclo[3.2.2]non-3-yl; and nontoxic, pharmaceutically acceptable salts, hydrates, solvates and N-oxides thereof.

4,507,486
PRODUCTION OF POLYCHLORINATED PYRIDINE MIXTURES BY LIQUID PHASE CHLORINATION OF 3,5-LUTIDINE OR 3,5-LUTIDINE HYDROCHLORIDE

Michael J. Marinak, Kelso, and John L. Simonson, Longview, both of Wash., assignors to Kalama Chemical, Inc., Kalama, Wash.

Filed Apr. 19, 1983, Ser. No. 486,377
Int. Cl.[3] C07D *213/61*
U.S. Cl. 546—345 23 Claims

1. The process of noncatalytically chlorinating 3,5-lutidine or 3,5-lutidine hydrochloride in liquid phase without substantial formation of intractable nonvolatiles, said process comprising:

(a) establishing in a reactor means a diluent reactor charge which is made up of chlorinated pyridine and/or lutidine compounds, said diluent being essentially nonreactive with chlorine in the sense of forming two moles or less of hydrogen chloride per mole of diluent under the reaction conditions to which the reactants in the reactor means are subjected;

(b) while maintaining the reactor charge in liquid phase and at a temperature of about 150° C. to 240° C., sparging

chlorine and 3,5-lutidine or 3,5-lutidine hydrochloride into the reactor charge near the bottom thereof at a chlorine-to-lutidine feed ratio of at least about 7:1 by weight and at a feed rate low enough so that any separation of the reactor charge into a second, lighter phase composed of unchlorinated 3,5-lutidine hydrochloride is minimized and is in any event less than about 10% of the reactor charge by volume, the excess of chlorine being fed to the reactor charge relative to the amount of 3,5-lutidine being fed thereto providing enhanced agitat2ion of the reaction mass and sufficient chlorine to ensure that the chlorine partial pressure in the vapor space over the reaction mass is greater than 50% of the total pressure;

(c) continuing chlorine addition and maintaining such reaction conditions until substantial side-chain and nuclear substitution of chlorine in the 3,5-lutidine or 3,5-lutidine hydrochloride has occurred; and

(d) continuing chlorine addition and maintaining the reaction mass in liquid phase and at a temperature of about 190° C. to 280° C. in a finishing reactor until the desired extent of side-chain and nuclear substitution of chlorine in the 3,5-lutidine or 3,5-lutidine hydrochloride has occurred.

4,507,487

CHEMICAL COMPOUNDS

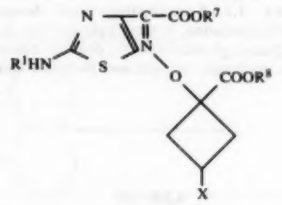
Hajime Kamachi, Urayasu; Jun Okumura, Yokohama; Takayuki Naito, Kawasaki; Masahisa Oka, Yokohama, and Haruhiro Yamashita, Ichikawa, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 422,632, Sep. 23, 1982,. This application Sep. 26, 1983, Ser. No. 536,024

Int. Cl.³ C07D *277/42*

U.S. Cl. 548—194 **3 Claims**

1. A compound of the formula



wherein R^1 is hydrogen or the trityl group, R^7 is hydrogen or (lower)alkyl, R^8 is hydrogen or the benzhydryl or t-butyl group and X is halogen, or, if R^7 or R^8 is hydrogen, a salt thereof.

4,507,488

N-PYRAZOLYLALKYLENEDIAMINE INTERMEDIATES

Fritz Wiedemann, deceased late of Weinheim-Lutzelsachsen, Fed. Rep. of Germany (by Ingrid Wiedemann, curator), and Ewald Rieger, Mannheim, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

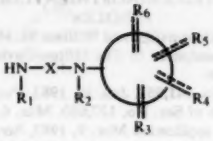
Continuation-in-part of Ser. No. 273,295, Jun. 15, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 483,788

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023369

Int. Cl.³ C07D *231/38*

U.S. Cl. 548—362 **5 Claims**

1. An N-pyrazolylalkylenediamine of the formula



wherein

R_1 and R_2 each independently is hydrogen, an alkyl radical containing up to 6 carbon atoms, or a benzyl radical,

X is an alkylene radical containing 2 to 6 carbon atoms,

A is a pyrazol-4-yl or a pyrazol-5-yl radical,

R_3, R_4, R_5 and R_6 each independently is hydrogen, or an alkyl radical containing up to 6 carbon atoms, which can be substituted by hydroxyl, carbamyl, C_3–C_8 cycloalkyl-, nitrile or carboxyl, an alkenyl radical containing 2 to 6 carbon atoms, a phenyl or carbamyl radical,

or a salt thereof.

4,507,489

ACETAL ESTERS

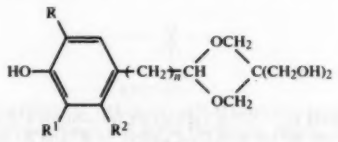
Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 262,266, May 11, 1981, abandoned. This application Sep. 9, 1982, Ser. No. 416,538

Int. Cl.³ C07D *319/06*

U.S. Cl. 549—375 **8 Claims**

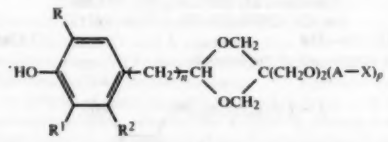
1. A process for the preparation of esters of pentaerythritol monoacetal comprising reacting a monoacetal of pentaerythritol having the structure



where R is alkyl, cycloalkyl or aralkyl having 3–10 carbon atoms, R^1 is alkyl of 1–6 carbon atoms, and R^2 is lower alkyl or hydrogen, with an ester-forming compound having the structure Cl_n—A—X where n is 1 or 2, A is

or p—O, X is an organic radical selected from the group consisting of phenolic groups, alkyl phenyl groups and phenylalkyl groups, and n is 0–3.

6. An ester of a pentaerythritol monoacetal having the structure



where R is alkyl, cycloalkyl or aralkyl having 3–10 carbon atoms, R^1 is alkyl of 1–6 carbon atoms, R^2 is lower alkyl or hydrogen, A is

or P—O, X is an organic radical selected from the group consisting of phenolic groups, alkyl phenyl groups and phenyl alkyl groups, n is 0–3 and p is 1–2.

4,507,490

PROCESS FOR THE PRODUCTION OF SULFUR CONTAINING ORGANOSILICON COMPOUNDS

Peter Panster, Rodenbach; Rudolf Michel, Freigericht; Peter Kleinschmit, and Ulrich Deschler, both of Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,308

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311340

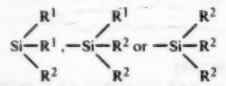
Int. Cl.³ C07F 7/08, 7/18

U.S. Cl. 556—427 **7 Claims**

1. A process for the production of a sulfur containing organosilicon compound of the formula

(1)

in which Z is the group



wherein

R^1 is an alkyl group having 1–5 carbon atoms, a cycloalkyl group having 5–8 carbon atoms, a benzyl group, a phenyl group, or a phenyl group substituted by methyl, ethyl, or chloro,

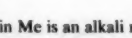
R^2 is an alkoxy group with a carbon chain having 1–5 carbon atoms or a cycloalkoxy group having 5–8 carbon, the phenoxy group, or the benzyloxy group,

Alk is a divalent saturated hydrocarbon group having 1–10 carbon atoms, and

x is a number from 1.0 to 6.0 which comprises at least partially dissolving in a polar organic solvent, a hydrogen sulfide of the formula

(2)

wherein Me is an alkali metal or an equivalent of an alkaline earth metal or of zinc or ammonium, then treating this dispersion or solution with an alkali metal, and, if x is >1, after the end of the development of H_2 with the necessary amount of sulfur, and directly subsequently further reacting with a compound of the formula



(3)

wherein Hal is a chlorine or bromine atom, separating the organic product from the halide formed and removing the organic solvent.

4,507,491

PROCESS FOR PREPARING 1-NITROBENZENE-2-ALKYLOXYCARBONYL-5-CARBOXYLIC ACIDS

Werner Wykypiel, Rodgau, and Wolfgang Tronich, Eppstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,008

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148422

Int. Cl.³ C07C 79/46, 76/02

U.S. Cl. 560—020 **6 Claims**

1. A process for preparing 1-nitro-benzene-2-alkoxy carbonyl-5-carboxylic acid from a dialkylester of benzene-1,4-dicarboxylic acid, comprising:

nitrating, in a nitration medium containing a nitric acid/sulfuric acid mixture, the dialkyl ester of benzene-1,4-dicarboxylic acid to obtain a 1-nitro-2,5-dicarboxylic acid dialkyl ester intermediate,

without isolation of said intermediate, diluting the nitration medium with an aqueous medium and adding a catalytic amount of a hydrolysis catalyst, said hydrolysis catalyst being an organic solvent which is at least partially miscible with water and has a boiling point above 90° C., an emulsifier, or a mixture thereof,

partially hydrolyzing said intermediate to the 1-nitrobenzene-2-alkoxycarbonyl-5-carboxylic acid product in an acidic hydrolysis step by means of the excess of sulfuric acid/nitric acid mixture remaining in the diluted nitration medium, and recovering said product from said diluted nitration medium, said organic solvent being a divalent aliphatic alcohol or lower alkyl ether or lower carboxylic acid ester thereof, a cyclic aliphatic ether, a lower carboxylic acid ester of a lower aliphatic alcohol, a lower aliphatic ketone, or a lower monocarboxyamide of a primary or secondary aliphatic amine or of ammonia.

4,507,492

PREPARATION OF AROMATIC DERIVATIVES

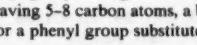
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 6, 1983, Ser. No. 492,114

Int. Cl.³ C07C 41/16

U.S. Cl. 560—64 **20 Claims**

1. A process for preparing an allyl derivative of an aromatic compound eorresponding to the formula:



wherein:

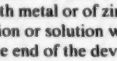
Ar is an aromatic radical of valence n optionally further substituted with one or more unreactive substituents, R;

X is —O—, —S— or —NR_6—;

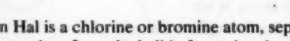
R_1, R_2, R_3, R_4, R_5 and R_6 independently eacli occurrence are hydrogen or a C_{1-20} hydrocarbyl group optionally further substituted with one or more unreactive substituents, R, wherein R is as previously defined; and

n is an integer greater than zero,

comprising contacting a phenolic, thiophenolic or arylamine compound corresponding to the formula:



wherein Ar, X and n are as previously defined, with an allyl lower alkyl carbonate corresponding to the formula:



wherein R_1–R_5 are as previously defined, and R_7 is lower alkyl in the presence of a catalytic amount of a catalyst comprising a metal selected from the group consisting of molybdenum, tungsten and group VIII metals.

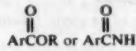
4,507,493

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC ACIDS AND DERIVATIVES THEREOF

Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,351
Int. Cl.³ C07C *69/76*
U.S. Cl. 560—103 11 Claims

1. A process for the preparation of compounds of the formula



wherein R represents H or an aliphatic moiety having up to about 12 carbon atoms and R' represents an aliphatic moiety having up to about 12 carbon atoms,
said process comprising reacting an aryl sulfonyl chloride of the formula

wherein Ar represents a carbocyclic or heterocyclic aromatic moiety having about 5 to about 20 atoms in the ring or rings thereof,
with (i) carbon monoxide and (ii) water or an aliphatic alcohol or primary amine having up to about 12 carbon atoms in the presence of a zero-valent metal catalyst consisting essentially of palladium.

4,507,494

PROCESS FOR THE PRODUCTION OF A DIESTER OF OXALIC ACID

Haruhiko Miyazaki; Yasushi Shiomi, both of Ube; Satoru Fujitus, Yamaguchi; Katsuro Masunaga, and Hiroshi Yanagisawa, both of Ube, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jan. 24, 1983, Ser. No. 460,574
Claims priority, application Japan, Jan. 26, 1982, 57-9517
Int. Cl.³ C07C *67/36*
U.S. Cl. 560—193 9 Claims

1. In a process for preparing a diester of oxalic acid by the vapor phase catalytic reaction of carbon monoxide with an ester of nitrous acid in the presence of a catalyst composed of a solid carrier and a catalyst component supported on the carrier, the improvement wherein said catalyst component is composed of

(a) a platinum-group metal or a salt thereof, and

(b) at least one member selected from the group consisting of Ti and an oxide thereof.

4,507,495

PROCESS FOR PRODUCTION OF ETHYL ACRYLATE

Edward F. Dougherty, League City; Mark O. Scates, Pearland, and James L. Paul, Houston, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,846
Int. Cl.³ C07C *67/04*
U.S. Cl. 560—205 17 Claims

1. In a process for the production of ethyl acrylate by reacting ethylene and acrylic acid in the presence of sulfuric acid, the improvement comprising adding metal ions selected from the group consisting of soluble manganese and cerium to the reaction mixture.

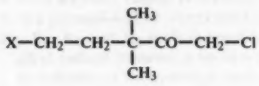
4,507,496

PROCESS FOR PREPARING 5-SUBSTITUTED 1-CHLORO-3,3-DIMETHYLPENTAN-2-ONES

Manfred Jautelat, Burscheid, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 460,687, Jan. 24, 1983,. This application May 25, 1984, Ser. No. 613,946
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204788
Int. Cl.³ C07C *45/59*
U.S. Cl. 560—266 9 Claims

1. Process for preparing 5-substituted 1-chloro-3,3-dimethylpentan-2-ones of the formula

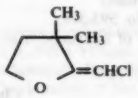


(I)

in which

X represents a halogen or an acyloxy radical having 1–8 carbon atoms,

which comprises reacting 2-chloromethylene-3,3-dimethyltetrahydrofuran of the formula



(II)

with an acidic compound of the formula

(III)

in which

X has the abovementioned meaning, at a temperature of 0° to 200° C.

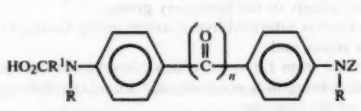
4,507,497

WATER SOLUBLE MICHLERS KETONE ANALOGS

Laurence W. Reilly, Jr., Yorktown Heights, N.Y., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

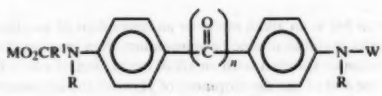
Filed Mar. 3, 1983, Ser. No. 471,838
Int. Cl.³ C07C *101/453*
U.S. Cl. 562—441 6 Claims

1. A compound having the general formula



(I)

or



(2)

wherein

R is an alkyl group of 1 to 8 carbon atoms,

R^1 is an alkylene group having 1 to 8 carbon atoms,

Z is R^1COOH or R^1H,

n is an integer having a value of 1 or 2,

M is a water-solubilizing cation, and

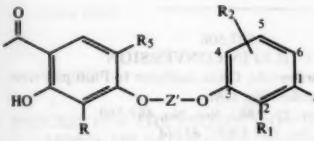
W is R^1COOM or R^1H.

4,507,498
PHENOXYCARBOXYLIC ACIDS

Matthew Carson, Nutley; Ronald A. LeMahieu, North Caldwell, and William C. Nason, Mountain Lakes, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 366,896, Apr. 9, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,719
Int. Cl.[3] C07C *69/76, 65/40*
U.S. Cl. 562—463 15 Claims

1. A compound of the formula



I(a)

wherein R is hydrogen or lower alkyl, R_1 is hydrogen or lower alkyl, R_2 is lower alkanoyl, R_3 is hydrogen or methyl, R_4 is hydrogen or lower alkyl, R_5 is hydrogen, halogen, lower alkyl or lower alkanoyl, Z^1 is lower alkylene or 2-hydroxypropylene, and n is an integer from 1 to 7, or, when R_4 is hydrogen,

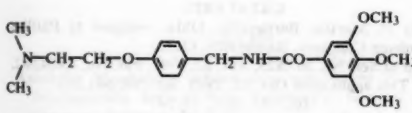
a salt thereof with a pharmaceutically acceptable base.

4,507,499
N-(4-HYDROXYBENZYL)-3,4,5-TRIMETHOXYBENZAMIDE AND METHOD FOR PRODUCING TRIMETHOBENZAMIDE CHLOROHYDRATE

Vittorio Rossetti, Milan; Alessandro Dondoni, Ferrara, and Giancarlo Fantin, Rovigo, all of Italy, assignors to Francis S.p.A., Caronno Pertusella, Italy

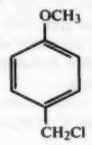
Filed Aug. 31, 1982, Ser. No. 413,554
Int. Cl.[3] C07C *103/44, 102/00*
U.S. Cl. 564—179 1 Claim

1. A method for producing trimethobenzamide chlorohydrate of formula:



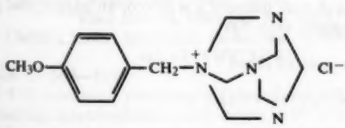
(I)

according to which anisole is reacted at a temperature in the range of 10°–15° C. with hydrochloric gas and formaldehyde in water to provide a compound of formula



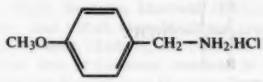
(II)

which is reflux treated with urotropine in a chlorinated solvent to provide a compound of formula



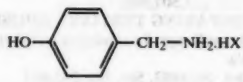
(III)

which is isolated by filtering and reflux reacted with hydrochloric acid in hydroalcohol solution, thus obtaining a compound of formula



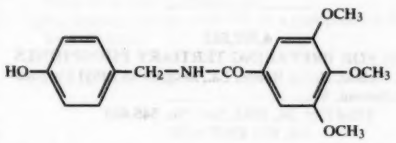
(IV)

which reacted under reflux condition with aqueous hydrobromic or hydroiodic acid provides a compound of formula



(V)

wherein X is Br or I, which is treated, in the presence of an inorganic base selected from the group comprising alkaline hydroxides, carbonates and bicarbonates, with 3,4,5-trimethoxybenzoic acid chloride to provide a compound of formula



(VII)

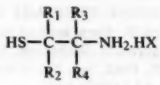
which is isolated and then treated, in the presence of alkaline hydroxides or hydrides, with N,N-dimethyamino ethyl chloride, thus obtaining trimethobenzamide chlorohydrate.

4,507,500
PROCESS FOR PRODUCING 2-MERCAPTOETHYLAMINE HYDROHALIDES

Shigenobu Nakayama, Kamakura; Eiichi Noda, Fujisawa; Yoshiaki Noguchi, Yokohama; Isamu Yamamoto, Zushi, and Noboru Kawasaki, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,091
Claims priority, application Japan, Jul. 15, 1980, 55-95642
Int. Cl.[3] C07C *149/24*
U.S. Cl. 564—340 18 Claims

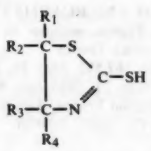
1. A process for producing 2-mercaptoethylamine hydrohalides of the general formula



(III)

wherein R_1, R_2, R_3 and R_4 are identical or different, and each represents a hydrogen atom, a lower alkyl group, a hydroxy-substituted lower alkyl group or a phenyl group, and X represents a halogen atom,

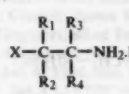
which comprises reacting 2-mercaptothiazoline of the general formula



(I)

wherein R_1, R_2, R_3 and R_4 are as defined above,

with a 2-halogenoethylamine hydrohalide of the general formula



(II)

wherein R_1, R_2, R_3, R_4 and X are as defined above, in an aqueous solvent.

4,507,501

PROCESS FOR PREPARING TERTIARY PHOSPHINES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 26, 1983, Ser. No. 545,463
Int. Cl.[3] C07F 9/50
U.S. Cl. 568—17 4 Claims

1. A process which comprises reacting a tertiary phosphine oxide with a sodium aluminum hydride/aluminum chloride reducing agent so as to form the corresponding tertiary phosphine.

4,507,502

PROCESS FOR PREPARING TERTIARY PHOSPHINES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Oct. 26, 1983, Ser. No. 545,468
Int. Cl.[3] C07F 9/50
U.S. Cl. 568—17 4 Claims

1. A process which comprises reacting a tertiary phosphine oxide with a sodium aluminum hydride/sodium aluminum chloride reducing agent so as to form the corresponding tertiary phosphine.

4,507,503

PROCESS FOR PREPARING TERTIARY PHOSPHINES

Frederick W. Frey, and John Y. Lee, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 25, 1983, Ser. No. 554,899
Int. Cl.[3] C07F 9/50
U.S. Cl. 568—17 5 Claims

1. A process for producing a tertiary phosphine which comprises reacting a tertiary phosphine oxide with a trialkylaluminum/trialkyl borate reducing agent at a temperature in the range of about 200°–400° C.

4,507,504

PROCESS FOR PREPARING TERTIARY PHOSPHINES

John Y. Lee, and Frederick W. Frey, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 25, 1983, Ser. No. 554,900
Int. Cl.[3] C07F 9/50
U.S. Cl. 568—17 8 Claims

1. A process for producing a tertiary phosphine which comprises reacting a tertiary phosphine oxide with a trialkylaluminum/boron trihalide reducing agent at a temperature in the range of about 200°–400° C.

4,507,505

PRODUCTION OF 2-MERCAPTO ETHANOL-1

Emmanuel Arretz, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Continuation of Ser. No. 267,552, May 27, 1981, abandoned.
This application Mar. 21, 1983, Ser. No. 477,358
Claims priority, application France, Jun. 6, 1980, 80 12621
Int. Cl.[3] C07C 149/18
U.S. Cl. 568—62 8 Claims

1. An improved process for the production of 2-mercapto ethanol-1 through action of hydrogen sulphide with liquid ethylene oxide, under pressure, in the presence of a catalyst and/or diluent, wherein the hydrogen sulphide in the gaseous state is placed in contact with liquid ethylene oxide, the pressure being adjusted in such a way that the maximum of gaseous H_2S is introduced in the liquid ethylene oxide, in which the temperature of the reaction medium is maintained between 50° and 60° C., the pressure is from 5 to 15 bars, the amount of H_2S is 1 to 1.3 moles per mole of ethylene oxide, the catalyst-diluent is thiodiglycol in an amount of about 0.2 to 0.4 moles per mole of ethylene oxide and the reaction time is from 15 to 120 minutes.

4,507,506

ALPHA-OLEFIN CONVERSION

Tod K. Shioyama, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1983, Ser. No. 487,360
Int. Cl.[3] C07C 45/34
U.S. Cl. 568—401 24 Claims

1. A composition useful for the catalytic conversion of long-chain alpha-olefin reactants to methyl ketones comprising:
(a) a palladium component,
(b) a co-catalyst component chosen from divalent copper compounds, and
(c) a solvent system containing about equal amounts of water and an organic co-solvent comprising at least one water miscible compound containing oxygen and sulfur in which the components of (a) and (b) are substantially soluble.

8. A process for the conversion of an alpha-olefin reactant to a methyl ketone comprising the step of (1) contacting the olefin with oxygen in the presence of:
(a) a palladium compound,
(b) a co-catalyst component chosen from divalent copper compounds, and
(c) a solvent system containing about equal amounts of water and an organic co-solvent comprising at least one water miscible compound containing oxygen and sulfur in which the components of (a) and (b) are substantially soluble.

4,507,507

CATALYSTS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 367,825, Apr. 12, 1982, Pat. No. 4,434,082.
This application Oct. 12, 1983, Ser. No. 541,223
Int. Cl.[3] C07C 45/34
U.S. Cl. 568—401 11 Claims

1. A process for the conversion of one or more olefinic compounds to corresponding carbonyl compounds, where said olefinic compounds are selected from the group consisting of acyclic olefinic compounds containing from 2–20 carbon atoms per molecule and having 1, 2, or 3 olefinic carbon-carbon double bonds per molecule and cyclic olefinic compounds containing 5–20 carbon atoms per molecule and having 1, 2, or 3 olefinic carbon-carbon double bonds per molecule, with a catalyst composition comprising:
(a) one or more palladium components,
(b) one or more heteropolyacid components conforming to the general formula

$$Hm[X_xMo_aV_bM_yO_z]$$

in which X is B, Si, Ge, P, As, Se, Te or I; M is W, Nb, Ta or Re; m, a, b and z are integers; x is zero or an integer; and y is zero or an integer such that

$$6 \leqq (y+a+b)/z \leqq 12 \text{ and}$$

$$m+Nx+6a+5b+N'y \leqq 2z;$$

in which each of N and N' is the number of the group of the periodic table to which X and M respectively belong;

(c) one or more surfactants selected from the group consisting of: quaternary ammonium salts, alkali metal alkyl sulfates, alkali metal salts of alkanoic acids, alkali metal salts of alkaryl sulfonic acids and 1-alkyl pyridinium salts; and

(d) two or more liquid phases, at least one of which is an aqueous phase, where said catalyst is contacted with said olefins in the presence of an oxygen containing gas under reaction condition of temperature and pressure such that conversion of said olefins to corresponding carbonyls takes place.

4,507,508

PROCESS FOR THE PRODUCTION OF UNSATURATED MONO- OR SATURATED DIALDEHYDES AND ACETALS THEREOF

Percy Hayden; Alec Mee, and Donald Wright, all of Cleveland, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 2, 1983, Ser. No. 490,510

Claims priority, application United Kingdom, May 11, 1982, 8213650; Feb. 2, 1983, 8302884

Int. Cl.³ C07C *45/49*

U.S. Cl. 568—487 **10 Claims**

1. In a process in which an unsaturated mono- or saturated dialdehyde or acetal thereof is produced by reacting a conjugated diolefine having 4 to 6 carbon atoms with carbon monoxide, hydrogen and an alcohol in the presence of a catalyst which comprises rhodium and a tertiary phosphine or phosphite, the improvement in which an acid selected from sulfuric acid, a sulphonic acid, phosphoric acid, phosphorous acid, a C_1 to C_4 alkyl ester of sulfuric acid or a C_1 to C_4 alkyl ester of a sulphonic acid which esters are soluble in the reaction medium is present in excess of 1 equivalent per gram atom of rhodium.

4,507,509

PURIFICATION OF BISPHENOL-A

Ashok K. Mendiratta, Schenectady, and Wayne F. Morgan, Mechanicville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1984, Ser. No. 568,017

Int. Cl.³ C07C *37/68, 39/16*

U.S. Cl. 568—724 **12 Claims**

1. A process for purifying solid water-crystallized crude bisphenol-A comprising contacting solid water crystallized crude bisphenol-A with an aqueous alkaline solution and recovering said solid water-crystallized crude bisphenol-A in substantially the same form.

4,507,510

PROCESS FOR PRODUCING XYLYLENEGLYCOL

Shigeo Yoshinaka; Tsukasa Toki; Tomoji Tsuji, and Seiji Uchiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,377

Claims priority, application Japan, Mar. 7, 1983, 58-36810

Int. Cl.³ C07C *33/26*

U.S. Cl. 568—811 **15 Claims**

1. A process for producing xylyleneglycol, which comprises reacting xylylenediamine with nitrite at 0° to 100° C. in the presence of more than 5 parts by weight of water per 1 part of the xylylenediamine, while maintaining the PH of the reaction mixture in the range of 1.5 to 5.0.

4,507,511

SORBITOL, PROCESS FOR ITS PREPARATION, AND USE THEREOF

Friedrich Reiff, Seeheim; Hartmut Härtner, Mühltal; Arno Basedow, Bad Vilbel; Hans-Wolfgang Hugenbusch, Höchst; Peter C. Schmidt, Marburg, and Hans Bardonner, Bad König, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,865

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245170

Int. Cl.³ C07C *31/26, 29/76*

U.S. Cl. 568—852 **20 Claims**

1. A modified sorbitol with improved tableting properties, having

(a) a melting point of about 96° C.,

(b) a bulk density of 0.3–0.6 g/ml,

(c) a γ-sorbitol content of at least 90% ,

(d) a purity of at least 98%,

(e) a specific surface area of 0.7–1.5 m^2/g,

(f) a bending strength of at least $7N/mm^2$ at a compressive force of at least 10,000N, and

(g) a friability of less than 1% at a compressive force of at least 10,000N.

4,507,512

PROCESS FOR HYDRATION OF OLEFINS

Yoshiharu Okumura, Tokyo; Setsuo Kamiyama, Saitama; Hiroshi Furukawa, Saitama, and Katsumi Kaneko, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1984, Ser. No. 610,045

Claims priority, application Japan, May 31, 1983, 58-94894; Jun. 6, 1983, 58-99482

Int. Cl.³ C07C *29/04, 31/10, 31/12, 31/135*

U.S. Cl. 568—897 **14 Claims**

1. An improved process for producing an alcohol by hydrating an olefin wherein the improvement comprises hydrating an olefin in the presence of a hydrogen-type catalyst having a silica/alumina molar ratio of 20 to 500 and a solvent using either:

A. hydrogen-type mordenite or hydrogen-type zeolite Y, and a sulfone; or

B. hydrogen-type crystalline aluminosilicate in which the entrance of the main void is formed by a 10-membered or 12-membered oxygen ring, and a C_2 to C_5 oxy acid or the lactones, lactides, methyl or ethyl esters thereof.

4,507,513

CATALYZED GRIGNARD COUPLING PROCESS

Eric G. DelMar, Hopewell, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 30, 1984, Ser. No. 575,131

Int. Cl.³ C07C *17/26*

U.S. Cl. 570—190 **1 Claim**

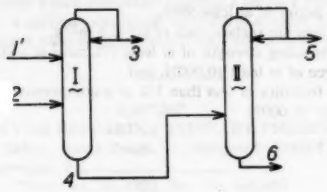
1. In a process for producing 3-chloro-2-methyl-[1,1'-biphenyl] by cross-coupling bromobenzene with 3-chloro-2-methylphenylmagnesium chloride in tetrahydrofuran using nickel(II) acetylacetonate as catalyst, the improvement therein which comprises using a catalytic amount of said catalyst in the range 0.02–0.04 mole percent based on said 3-chloro-2-methylphenylmagnesium chloride.

4,507,514

METHOD FOR PURIFYING 1,2-DICHLOROETHANE

Yusaku Ariki; Takio Hino, and Noboru Yoshida, all of Takasago, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 246,154, Mar. 23, 1981, Pat. No. 4,351,976. This application Sep. 28, 1982, Ser. No. 425,696
Claims priority, application Japan, Mar. 26, 1980, 55-39591
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ B01D 3/34
U.S. Cl. 570—262 8 Claims



1. In a method for purifying 1,2-dichloroethane by passing through a distillation column a crude 1,2-dichloroethane produced by oxychlorination of ethylene with at least one of a crude 1,2-dichloroethane produced by direct chlorination of ethylene and a crude uncracked 1,2-dichloroethane recovered in thermal cracking of 1,2-dichloroethane, the improvement which comprises feeding a crude 1,2-dichloroethane produced by the oxychlorination to an upper plate of a distillation column, feeding to at least one plate sufficiently below said upper plate at least one crude 1,2-dichloroethane of a crude 1,2-dichloroethane produced by the direct chlorination and a crude uncracked 1,2-dichloroethane recovered in thermal cracking, and recovering 1,2-dichloroethane as a bottom product containing 0 to 8,000 p.p.m. of carbon tetrachloride, the concentration of said carbon tetrachloride being stabilized within the fluctuation range of ±500 p.p.m.

6. In a method for preparing vinyl chloride which comprises purifying 1,2-dichloroethane by passing through a low boiler column a crude 1,2-dichloroethane produced by oxychlorination of ethylene with at least one of a crude 1,2-dichloroethane produced by direct chlorination of ethylene and a crude uncracked 1,2-dichloroethane recovered in thermal cracking of 1,2-dichloroethane and passing through a high boiler column the bottom product obtained from the low boiler column, and subjecting the purified 1,2-dichloroethane to thermal cracking, the improvement which comprises feeding a crude 1,2-dichloroethane produced by the oxychlorination to an upper plate of a low boiler column, feeding to at least one plate of the low boiler column sufficiently below said upper plate at least one crude 1,2-dichloroethane of a crude 1,2-dichloroethane produced by the direct chlorination and a crude uncracked 1,2-dichloroethane recovered in thermal cracking, and recovering from the low boiler column 1,2-dichloroethane as a bottom product containing 0 to 8,000 p.p.m. of carbon tetrachloride, the concentration of said carbon tetrachloride being stabilized within the fluctuation range of ±500 p.p.m.

4,507,515

LUBRICATING OIL COMPOSITIONS CONTAINING ETHYLENE-ALPHA-OLEFIN POLYMERS OF CONTROLLED SEQUENCE DISTRIBUTION AND MOLECULAR HETEROGENEITY

John E. Johnston, Westfield; Ricardo Bloch, Scotch Plains; Gary W. Ver Strate, Matawan, and W. R. Song, Short Hills, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 21, 1983, Ser. No. 564,018
Int. Cl.³ C10M 1/18
U.S. Cl. 585—12 22 Claims

1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity exhibiting improved viscosity and pumpability properties at low temperatures containing an effective amount of an ethylene alpha-olefin copolymer of controlled sequence distribution and molecular heterogeneity, said copolymer having a major and minor portion, the major portion having a Mw (weight average molecular weight) of about 10,000 to 500,000, a Mooney viscosity at 100° C. of 0.5 to 500 and a thickening efficiency of 0.4 to 4.0, an ethylene content of 10 to 60 wt% ethylene and an ethylene sequence distribution such that the mean number of ethylene units in sequences equal to or greater than three consecutive ethylene units is a value of about 3 to 4.5 and the fraction of ethylene sequences containing three or more consecutive ethylene units is about 0.01 to 0.30 based on the total number of ethylene sequences in said major portion, and said minor portion has an Mw of 1,000 to 2,000,000, an ethylene content of 55 to 95 wt% ethylene, an ethylene sequence distribution such that the mean number of ethylenes in sequences equal to or greater than three consecutive ethylene units is a value of about 4 to 20 and the fraction of ethylene sequences containing three or more consecutive ethylene units is about 0.35 to 0.95, based on the total number of ethylene sequences in said minor portion.

17. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity containing an effective amount of a polymeric viscosity index improving additive where low temperature viscosity and pumpability is improved by incorporation into said lubricating oil composition of 0.01 to 10 wt%, based on the weight of said polymeric viscosity index improving additive, of an ethylene-alpha-olefin copolymer pumpability additive having a Mw molecular weight of about 1,000 to 2,000,000, an ethylene content of 55 to 95 wt% ethylene, an ethylene sequence distribution such that the mean number of ethylenes in sequences equal to or greater than three consecutive ethylene units is a value of about 4 to 20 and the fraction of ethylene sequences of three or more consecutive ethylene units is from about 0.35 to 0.95, based on the total number of ethylene sequences in said copolymer.

4,507,516

FUEL COMPOSITION

Seiji Hirooka, and Michiaki Torii, both of Tokyo, Japan, assignors to Nippon Petrochemicals Co., Ltd., Japan

Filed Mar. 14, 1984, Ser. No. 589,644
Claims priority, application Japan, Mar. 18, 1983, 58-45704
Int. Cl.³ C01J 1/04
U.S. Cl. 585—14 4 Claims

1. A fuel composition comprising a hydrogenated material obtained by hydrogenating a reaction mixture ranging from C_{11} to C_{16} containing mainly compounds which comprise butadiene and cyclopentadiene as basic structural units produced by reacting an acyclic conjugated diene with cyclopentadiene, dicyclopentadiene, an alkyl-substituted cyclopentadiene, or an alkyl-substituted dicyclopentadiene in accordance with Diels-Alder reaction, an isomeric material prepared by isomerizing the hydrogenated material or the mixture of the hydrogenated material and the isomeric material.

4,507,517

CONVERSIONS OF LOW MOLECULAR WEIGHT HYDROCARBONS TO HIGHER MOLECULAR WEIGHT HYDROCARBONS USING A BORON COMPOUND CONTAINING CATALYST

Louis Devries, Greenbrae, and P. R. Ryason, Santa Rosa, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1983, Ser. No. 547,698
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—415 **10 Claims**

1. A process for the production of higher molecular weight hydrocarbons from lower molecular hydrocarbons comprising the steps of:

(a) introducing into a reaction zone a lower molecular weight hydrocarbon-containing gas and contacting said gas in said zone with a boron compound containing catalyst under C_2+ hydrocarbon synthesis conditions such that at least 15 mole percent of the lower molecular weight hydrocarbons in said gas are converted to higher molecular weight hydrocarbons, said conditions including a temperature of greater than 1000° C. and a gas hourly space velocity of greater than 3200 hr^{-1};

(b) withdrawing from said reaction zone a higher molecular weight hydrocarbon-containing stream.

4,507,518

DEHYDRATION OF 2,5-DIMETHYL-2,5-HEXANEDIOL

David V. Petrocine, Saddle River, and Ronald Harmetz, Randolph, both of N.J., assignors to Penick Corporation, Lyndhurst, N.J.

Filed Dec. 14, 1983, Ser. No. 561,403
Int. Cl.³ C07C *1/24*
U.S. Cl. 585—610 **15 Claims**

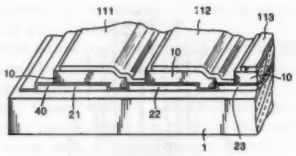
9. A continuous process for the conversion of 2,5-dimethyl-2,5-hexanediol into 2,5-dimethyl-2,4-hexadiene which comprises passing a mixture of 2,5-dimethyl-2,5-hexanediol and a lower aliphatic alcohol over a montmorillonite clay catalyst at a temperature of from about 200° C. to about 300° C.

4,507,519

PHOTOELECTRONIC CONVERSION DEVICE

Maruyama Kazumi, and Uchida Yoshiyuki, both of Yokosuka, Japan, assignors to Fuji Electric Co., Ltd. and Fuji Electric Corporate Research & Development Co., Ltd., both of, Japan

Filed Feb. 1, 1983, Ser. No. 462,878
Claims priority, application Japan, Feb. 9, 1982, 57-19051
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—258 15 Claims



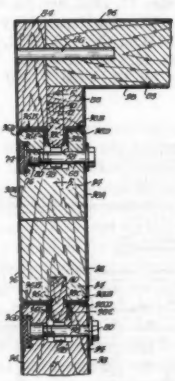
9. A photoelectronic conversion device comprising:
a transparent insulative substrate;
a first transparent electrode layer on said substrate, said first electrode layer having a relatively low sheet resistance;
a second transparent electrode layer on said first transparent electrode layer, said second electrode layer having a relatively high plasma resistance; and
an amorphous semiconductor film on said second transparent electrode layer, wherein the first transparent electrode layer comprises a plurality of separate segments and the second transparent electrode layer comprises a substantially continuous sheet over said separate first electrode segments.

4,507,520

DOUBLE ISOLATED SHIELDING ENCLOSURE

Erik A. Lindgren, 4559 Cordoba Way, Oceanside, Calif. 92056

Filed Jan. 27, 1984, Ser. No. 574,702
Int. Cl.[3] H05K *9/00*
U.S. Cl. 174—35 MS 8 Claims



1. In a double isolated electrically shielding screen room, at least first and second panels adapted to be interconnected along marginal edges thereof, said panels including respective first and second frames of electrical insulating material, said first frame having a tongue extending medially along and outwardly of at least one marginal edge thereof and said second frame having a groove extending medially along and inwardly of at least one marginal edge thereof, and shielding covering sides of said frames, said shielding on said first frame terminating in flanges spaced apart and electrically isolated from each other on opposite sides of said tongue and extending only a portion of the way toward an outer end of said tongue and said shielding on said second frame terminating in flanges spaced apart and electrically isolated from each other on opposite sides of said groove and extending only a portion of the way toward an inner end of said groove, said tongue and flanges thereon of said first panel being extended into said groove and flanges therein of said second panel to interconnect said panels along said at least one marginal edges thereof, to electrically connect the flanges on one side of each of said tongue and groove, and to electrically connect the flanges on an opposite side of each of said tongue and groove, whereby said shielding on the same sides of said panels is electrically connected but electrically isolated from said shielding on opposite sides of said panels, wherein said electrically connected flanges overlap and extend in generally parallel planes, and including a plurality of passages through and spaced longitudinally along said tongue outwardly of said flanges thereon, and clamping means normal to said groove in said second panel for compressibly clamping together said overlapped and electrically connected flanges, said clamping means comprising a first plurality of fasteners in said second frame to one side only of and spaced longitudinally along said groove inwardly of said flanges therein and in alignment with respective ones of said passages through said tongue, each of said first plurality of fasteners being out of contact with said shieldings, and a second plurality of fasteners extended through said second frame and said shielding thereon to an opposite side of said groove, said second plurality of fasteners being spaced longitudinally along said groove in alignment with respective ones of said tongue passages and said first plurality of fasteners and extending through said passages into engagement with said first plurality of fasteners, wherein outer ends of said second plurality of fasteners are outwardly of said shielding on said second frame to said opposite side of said groove and are manipulatable to move said first and second pluralities of fasteners together to compressibly clamp together said overlapped flanges into secure electrical contact and substantially radio frequency leakproof relationship.

4,507,521

HIGH PRESSURE ELECTRICAL CONDUCTIVITY PROBE

Allan R. Goellner, Parma Heights, Ohio, assignor to The Clark-Reliance Corp., Cleveland, Ohio

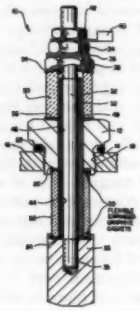
Filed Sep. 29, 1982, Ser. No. 427,490
Int. Cl.[3] H01B *17/30*
U.S. Cl. 174—151 12 Claims

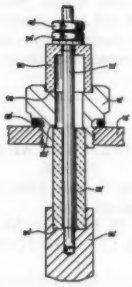
7. An electrical conductivity probe designed to withstand high pressures comprising
a conductive electrode connector,
a metal mounting body,
means for conductively mounting said metal mounting body to a pressure vessel,
an external terminal,
means providing an electrical connection between said electrode connector and said external terminal adapted to complete an electrical circuit when a conductive liquid comes into contact with said electrode connector and a wall of a pressure vessel to which the probe is adapted to be mounted through electrical, conductive contact with said metal mounting body,
means to electrically insulate said metal mounting body and said electrode connector to prevent the former from short circuiting the electrical circuit when the electrode connector comes into contact with a conductive liquid,
said means to insulate being an insulator capable of withstanding high temperatures and pressures up to about 3000 psi,
said insulator having a cylindrical outer surface along the length thereof and planar surfaces at each end thereof, said planar end surfaces lying in substantially parallel planes which are perpendicular to the longitudinal axis of the insulator and which surfaces intersect the cylindrical outer surface,

a first cylindrical recess in one end of said electrode connector having a planar surface, said first cylindrical recess having a diameter less than the diameter of said electrode connector creating a first annular projection integral with and forming a unitary part of said electrode connector,

a second cylindrical recess in one end of said metal mounting body having a planar surface, said second cylindrical recess having a diameter substantially equal to said first cylindrical recess and having a diameter less than the diameter of said metal mounting body creating a second annular projection integral with and forming a unitary part of said metal mounting body,

each of said planar end surfaces and an adjacent portion of





the cylindrical outer surface of said insulator being located in one of said cylindrical recesses in said metal mounting body and said electrode connector,

means for forming a seal in the cylindrical recesses with said planar end surfaces of said insulator, and

said means for forming a seal comprising means for forming a mechanical high pressure joint between said insulator and said respective cylindrical recesses in said metal mounting body and said electrode connector by sealing surface means on said electrode connector and said metal mounting body for forming a compression seal with said insulator to create compression in said insulator between said insulator and said respective cylindrical recesses in said metal mounting body and said electrode connector.

4,507,522

TERMINAL ASSEMBLY

James C. Kyle, Roseburg, Oreg. 97470

Filed Jul. 16, 1981, Ser. No. 284,130

Int. Cl.³ H01B *17/26;* **C03C** *27/02*

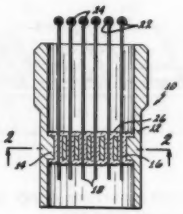
U.S. Cl. 174—152 GM **4 Claims**

1. In combination in a terminal assembly,

a sleeve made from a first electrically conductive material and provided with a barrel portion and with a shelf portion extending across the sleeve and provided with at least one hole,

a pin made from the first electrically conductive material and clad with a noble metal, the pin being disposed through the hole in the shelf portion in spaced relationship to the shelf portion

a ceramic insulating material disposed in the hole and hermetically sealing the pin to the sleeve, the ceramic insulating material being partially amorphous and partially polycrystalline,



the first electrically conductive material having a coefficient of thermal expansion which changes in a particular relationship with progressive changes in temperature and the ceramic insulating material having a coefficient of thermal expansion which changes in approximately the particular relationship with the progressive changes in temperature to temperatures of approximately 1000° F.,

the ceramic insulating material being made from boric acid and oxides of zirconium, titanium, sodium, lead and silicon.

4,507,523

POSITION DETERMINATION APPARATUS

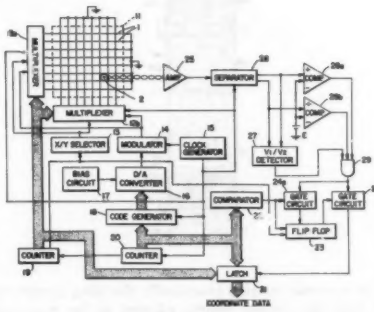
Yoshihiro Gohara, Osaka; Masashi Kanno, and Ichiro Yamashita, both of Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 17, 1983, Ser. No. 496,493

Claims priority, application Japan, May 19, 1982, 57-85159; Oct. 18, 1982, 57-183150; Oct. 19, 1982, 57-183954; Mar. 8, 1983, 58-37643; Mar. 15, 1983, 58-43508

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—19 **10 Claims**



1. A position determination apparatus comprising:

an interface plate having plural conductors installed thereon in the form of a matrix with specified spaces in X and Y directions;

a control means for supplying two currents to two conductors in the same direction out of said plural conductors, which comprises: a current source for producing a current; a selection means coupled to said current source for

selecting said two conductors in the same direction out of said plural conductors and supplying said two currents to the selected two conductors; and a scanning means for controlling said current source and for giving address data for selecting said two conductors to said selection means, said two currents applied to said two conductors being so controlled as to be in a predetermined relation to each other;

a pickup means movably positioned on said interface plate for picking up two induced voltages induced by magnetic fields generated by said two currents flowing through said selected two conductors;

a detection means coupled to said pickup means for detecting a predetermined relation between said two induced voltages; and

a deriving means coupled to said control means and said detecting means for deriving current data and said address data when said detection means detects said predetermined relation between said two induced voltages, thereby to obtain a coordinate data corresponding to the position of said pickup means on said interface plate.

4,507,524

LOUDSPEAKER TELEPHONE SYSTEM

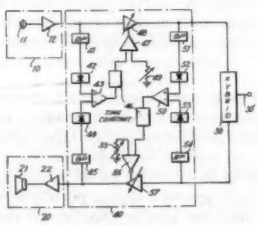
Jin H. Yun, Seoul, Rep. of Korea, assignor to Gold Star Tele-Electric Co., Ltd., Inc., Seoul, Rep. of Korea

Filed Mar. 17, 1982, Ser. No. 358,965

Claims priority, application Rep. of Korea, Mar. 18, 1981, 892/1981; Mar. 18, 1981, 893/1981; Mar. 18, 1981, 894/1981

Int. Cl.³ H04M *1/60*

U.S. Cl. 179—81 B **18 Claims**



1. A loudspeaker telephone system having an external signal pair, loudspeaker, microphone and handset having a handset microphone and a handset speaker, comprising:

power supply means for powering the loudspeaker telephone system from the external signal pair;

hybrid circuit means, powered by the external signal pair, for matching a signal on the external signal pair to one of the handset microphone, handset speaker, microphone and the loudspeaker, and vice versa; and

voice switching means for selecting a signal path between the external signal pair and the microphone and the external pair and the loudspeaker, said voice switching means including band pass means for rejecting indoor noises and line noise; comparator means for determining whether a signal has been received from the microphone or the external signal pair and generating a send signal or a receive signal respectively, in response; time constant means for exponentially controlling the rise and fall of the send and the receive signals; and variable gain means, for variably amplifying signals from the microphone and the external signal pair, said variation in amplification being controlled by the send and the receive signal;

whereby the exponential rise and fall of the send and receive signals caused by the time constant means causes an exponential variation in gain of the variable gain means.

4,507,525

TRANSISTORIZED BRIDGE RECTIFIER CIRCUIT WITH OVERCURRENT PROTECTION FOR USE IN TELEPHONES

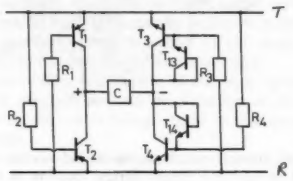
Marco Siligoni, and Nazzareno Rossetti, both of Milan, Italy, assignors to SGS-Ates Componenti Elettronici SpA, Milan, Italy

Filed Jan. 25, 1983, Ser. No. 460,874

Claims priority, application Italy, Jan. 29, 1982, 19356 A/82

Int. Cl.³ H04M *1/74*

U.S. Cl. 179—81 R **29 Claims**



1. A transistorized bridge rectifier circuit with overcurrent protection for joining an electronic circuit of a telephone subscriber set to a telephone line having first and second wires, said rectifier circuit comprising: first, second, third, and fourth elements of a bridge, each element having a first and a second terminal, said second terminal of said first element being connected to said second terminal of said second element and said second terminal of said third element being connected to said second terminal of said fourth element, said connections respectively constituting first and second coupling terminals to which is connected said electronic circuit of said telephone subscriber set; said first terminals of said first and third elements being connected to said first wire of said telephone line, and said first terminal of said second and fourth elements being connected to said second wire of said telephone line; each element of said bridge comprising at least one first bipolar transistor having its emitter and collector connected between said first and second terminals of its element, said emitter of said first transistor being connected to said first terminal of its element, said transistors of said first and second elements having a first type of conductivity which is the opposite from a second type of conductivity of the transistors of said third and fourth elements; the base of each of said transistors are connected to a control circuit means which is sensitive to the polarity of the telephone line voltage across said first and second wires and which controls the conduction of said transistors of said first and fourth elements of said bridge so as to be opposite to the conduction of said transistors of said second and third elements of said bridge, wherein a base of said first transistor of each of said third and fourth bridge elements is connected to said second terminal of its element by means of a first semiconductor element having a bipolar junction which is normally reverse-biased.

4,507,526

MODULE UNIT TIME SWITCH DISK ASSEMBLY

Fritz Thoma, Haslach, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Continuation of Ser. No. 346,844, Feb. 8, 1982, abandoned. This application Dec. 5, 1983, Ser. No. 558,771

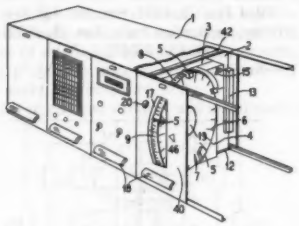
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104535

Int. Cl.³ H01H *43/10;* **H02B** *1/00;* **H05K** *7/00*

U.S. Cl. 200—38 R **9 Claims**

1. Time switch apparatus for use in a system housing in the form of a module unit being transversely removable from said housing and having a front plate for facing flush with the front of said housing, comprising a rotatable timing disk adapted for rotation in said module unit about an axis longitudinal of said

housing and having time scale markings extending circumferentially about said disk said front plate having an opening through which a portion of the circumference of said disk protrudes exterior of said housing front, adjustably positionable cam riders selectively mounted along the circumference



of said disk, control switch means on said module unit for being triggered by said cam riders during rotation of said disk, and mounting means for enabling transverse movement of said disk module unit away from said housing to permit adjustment of cam rider positions on said timing disk in said module unit.

4,507,527

CURRENT LIMITING CIRCUIT-BREAKER HAVING AN IMPROVED CONTACT ARRANGEMENT

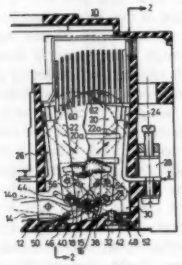
Franco P. Pardini, Milan, Italy, assignor to General Electric Company, New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 485,925

Claims priority, application Italy, May 21, 1982, 21411 A/82

Int. Cl.³ H01H *33/14, 9/40*

U.S. Cl. 200—145 **7 Claims**



1. An improved current limiting circuit breaker of the type consisting of one or more poles, each pole comprising two pairs of contacts, electrically connected in series, and each contact pair being within a separate chamber, the improvement comprising:

two circuit breaker chambers arranged side by side within a circuit breaker casing, each of said chambers containing a separate pair of contacts electrically connected in series, whereby upon separation of said contact pairs, a corresponding pair of arcs are created, said arcs being motivated by electrodynamic forces caused by current flow in the same direction through said two contact pairs;

each of said contact pairs consisting of a movable contact arm and a fixed contact arm, said fixed contact arms within each pair being connected with line and load breaker terminals and said movable contact arms within each pair being electrically connected together and being pivotally rotatable in opposite directions; and

each of said movable contact arms including an end pin at an end opposite from the contact and a pin intermediate said end pin and said contact, said movable contact arms being pivotally supported by said end pin within an end slot and being pivotally supported by said intermediate pins within an intermediate slot whereby said movable contact arms rotate about said intermediate pins and said end pin slides within said end slot upon short circuit overcurrent and whereby said movable contact arms then rotate about said end pins add said intermediate pin then slides within said intermediate slot.

4,507,528

PILOT LAMP

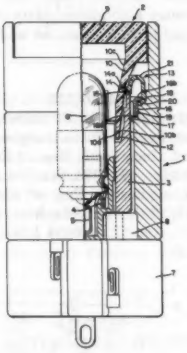
Ernst Vogel, Wiesenstr. 15, CH-4057 Basel, Switzerland, and Fritz Berger, Hofacker 381, CH-4625 Oberbuchsiten, both of Switzerland

Filed Nov. 5, 1982, Ser. No. 439,641

Claims priority, application Switzerland, Nov. 5, 1981, 7082/81

Int. Cl.³ H01H *13/06*

U.S. Cl. 200—302.2 **20 Claims**



1. A signal lamp, comprising a housing member; a switching member in said housing member; a mobile actuator having an end portion and an external surface tapering toward said end portion; and an annular membrane having a first marginal portion mounted on mounting means in said housing member and a deformable second marginal portion defining a passage whose cross-sectional area in undeformed condition of said second marginal portion exceeds the cross-sectional area of said external surface in the region of said end portion but is less than the maximum cross-sectional area of said external surface, said actuator being movable between a detached position and an attached position of engagement with said switching member to thereby advance said end portion through and beyond said passage during movement to said attached position whereby said external surface sealingly engages and tends to entrain said second marginal portion during further movement of said actuator toward engagement with said switching member, said switching member having stop means located in the path of movement of said second marginal portion entrained by said external surface of said actuator and enabling said external surface to move relative to and expand said second marginal portion during movement of said actuator to said attached position.

4,507,529

FOOD EMISSION SENSING

Peter H. Smith, Louisville, Ky., and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 29, 1983, Ser. No. 508,730

Int. Cl.³ H05B *6/64*

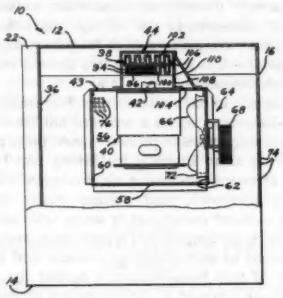
U.S. Cl. 219—10.55 A **11 Claims**

1. A microwave oven comprising:

a cooking cavity for receiving objects to be heated during the oven cooking cycle;

means for providing a continuous circulation of air through said cavity during the cooking cycle whereby contaminants emitted from the objects being heated become entrained in the circulating air, said air circulation providing means including exit means for permitting the circulating air to exit said cavity;

air channeling means formed externally of said cavity defining an exhaust flow path to the exterior for air exiting said cavity via said exit means;



sensing means positioned in said exhaust flow path responsive to gaseous constitutents of the air passing therethrough; and

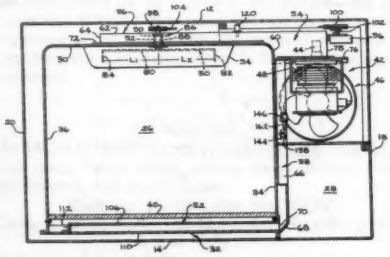
conversion means positioned in said flow path upstream of said sensing means for converting non-gaseous contaminants carried by the air to gaseous form during the cooking cycle; whereby accumulation of non-gaseous contaminants on said sensing means is prevented.

4,507,530

AUTOMATIC DEFROST SENSING ARRANGEMENT FOR MICROWAVE OVEN

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 15, 1983, Ser. No. 523,178
Int. Cl.³ H05B 6/08
U.S. Cl. 219—10.55 B **8 Claims**



1. A microwave oven operable in a defrost mode in which objects in a frozen state are converted to a thawed state, said oven comprising:

a cooking cavity for heating objects received therein;

a source of microwave energy external of said cavity;

a waveguide for supporting an electromagnetic field therein to couple microwave energy from said source to said cavity;

sensing means for monitoring the field strength of said electromagnetic field supported in said waveguide at a predetermined location and generating a field strength signal indicative thereof;

means for periodically introducing an electromagnetic field discontinuity in said waveguide, said discontinuity being effective to substantially increase the difference in the phase and magnitude of the field in said waveguide when an object in its frozen state is being heated in said cavity relative to that for the object in its thawed state, thereby providing a readily detectable difference in sensed field strength at said predetermined location between that corresponding to the object in its frozen state and that corresponding to the object in its thawed state;

means for sampling said field strength signal when said electromagnetic field discontinuity is present in the waveguide to detect a signal indicative of the object being heated having assumed its thawed state; and

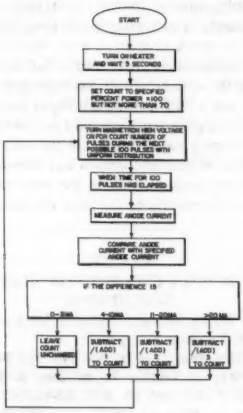
means for controlling termination of the oven operation in the defrost mode in response to detection of said signal indicative of the object being heated having assumed its thawed state.

4,507,531

REGULATED MICROWAVE OVEN AND METHOD, USING UNIFORMLY SPACED, INTEGRAL CYCLE CONTROL

Wesley W. Teich, Wayland, and Joseph R. Adamski, Brighton, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 317,022, Oct. 30, 1981, abandoned. This application Dec. 16, 1983, Ser. No. 562,047
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B **16 Claims**


START
TURN ON HEATER AND WAIT 3 SECONDS
SET COUNT TO SPECIFIED PERCENT POWER +100 BUT NOT MORE THAN 710
TURN MAGNETRON HIGH VOLTAGE ON FOR COUNT NUMBER OF PULSES DURING THE NEXT POSSIBLE 100 PULSES WITH UNIFORM DISTRIBUTION
WHEN TIME FOR 100 PULSES HAS ELAPSED
MEASURE ANODE CURRENT
COMPARE ANODE CURRENT WITH SPECIFIED ANODE CURRENT
IF THE DIFFERENCE IS
0—20MA
4—20MA
11—20MA
>20 MA
LEAVE COUNT UNCHANGED
SUBTRACT /1400/ TO COUNT
SUBTRACT /1400/ TO COUNT
SUBTRACT /1400/ TO COUNT

1. A microwave oven, comprising:

a microwave cavity;

a magnetron coupled to said cavity;

an ac to dc power supply connected to said magnetron;

means for providing a signal corresponding to the anode current drawn from said power supply by said magnetron; and

means responsive to said signal for sequentially calculating the number of ac cycles to be supplied to said power supply during each time interval of a sequence of time intervals and for supplying said calculated number of ac cycles to said power supply, each of said time intervals corresponding to a fixed number of ac line cycles, said supplied ac cycles for each of said time intervals being distributed substantially uniformly over each of said time intervals.

4,507,532

WIRE-CUT ELECTRIC DISCHARGE MACHINE

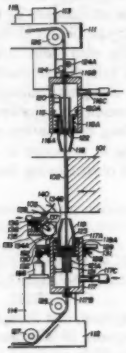
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohamashi, Japan

Filed May 17, 1983, Ser. No. 495,498

Claims priority, application Japan, May 18, 1982, 57-82469; Aug. 9, 1982, 57-138230; Feb. 22, 1983, 58-28984

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W 19 Claims



15. A method of operating a wire-cut electric discharge machine having a working fluid nozzle, comprising passing a wire electrode through the nozzle, passing working fluid through the nozzle for discharge with the wire electrode in a first stream substantially coaxial with said wire electrode, passing the wire electrode and said working fluid through a slit being formed by spark erosion in a workpiece, relatively advancing the workpiece and the nozzle for continuous formation of said slit, the wire electrode having a front portion facing the workpiece and a back portion facing in the direction of the formed slit, discharging working fluid in a second stream into said slit to produce greater impact on the wire electrode than the working fluid in said first stream and directing said second stream against the back portion of the wire electrode to prevent arch-like deformation of the wire electrode.

4,507,533

POWER SUPPLY CIRCUIT FOR ELECTRICAL MACHINING

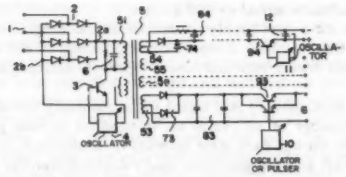
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jun. 2, 1978, Ser. No. 911,947

Claims priority, application Japan, Jun. 3, 1977, 52-65926; Jun. 8, 1977, 52-67610; Oct. 19, 1977, 52-125947; Oct. 26, 1977, 52-128492; Feb. 24, 1978, 53-20617; Mar. 10, 1978, 53-28751

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 P 18 Claims



1. A power supply circuit for electrical machining, comprising:

transformerless input means connectable directly to a commercial alternating current at a commercial supply frequency;

a rectifier connected to said input means directly for converting the commercial alternating current at the original voltage thereof to a direct current;

means connected to said rectifier for pulsing said direct current to produce a high-frequency output at a frequency much higher than that of said commercial alternating current and said commercial supply frequency, said high-frequency output being at least 1 kHz;

a high-frequency transformer connected to said pulsing means for transforming the voltage magnitude of said high-frequency output to a high frequency signal at said high frequency of at least 1 kHz to a desired voltage level of said high-frequency output; and

means connected to said transformer for producing from said high-frequency signal a series of unidirectional electrical machining pulses of predetermined pulse parameters and applying same across a machining gap formed between an electrical machining electrode and a workpiece juxtaposed therewith, said pulsing means including a switching element connected in series with said rectifier and a primary winding of said transformer, and an oscillator connected to said switching element and having the frequency of said high-frequency output for triggering said switching element at the frequency of the high-frequency output, a capacitor being coupled across said primary winding in series with said switching element and said rectifier, the means for producing the unidirectional electrical machining pulses including a second rectifier connected in series with a secondary winding of said high-frequency transformer for converting the transformer high-frequency output of said high-frequency transformer into a second direct current, a second switching element connected in series with said second rectifier for pulsing said second direct current, and a second oscillator having preset pulse parameters of the unidirectional electrical machining pulses connected to said second switching element for triggering same.

4,507,534

WELDING ROBOT

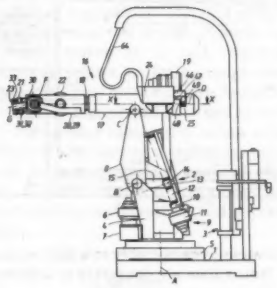
Herbert Kaufmann, and Jan Larsson, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jan. 12, 1983, Ser. No. 457,477

Claims priority, application Sweden, Jan. 15, 1982, 8200203

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—86.7 5 Claims



1. A current-carrying handling robot comprising a base,

a stand supported on said base so as to turn about a first axis,

a first arm rotatably journalled on said stand so as to turn thereon about a second axis,

a second arm rotatably journalled on said first arm so as to turn thereon about a third axis,

a support member for a current-consuming appliance mounted on said second arm, said support member including a tubular unit which is rotatably journalled to said second arm so as to be rotatable about a fourth axis which extends along the longitudinal dimension of said second arm and is fixed in relation to this arm, said unit having tubular concentric conductors for carrying electrical current to an appliance connected to said support member,

a welding transformer mounted on said second arm,

electrical connection means connected between said transformer and said conductors of said unit, said electrical connection means including axially fixed and axially movable contacts rotatable in relation to each other,

means to press said axially movable contacts against said axially fixed contacts together when current flow thereacross is required, and

means to separate said axially movable contacts from said axially fixed contacts to allow relative rotary movement therebetween.

4,507,535

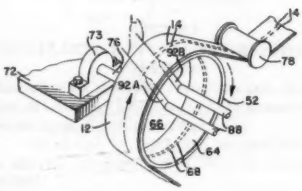
METHOD AND APPARATUS FOR PERFORATING MATERIAL

William T. Bennett, Cary, and Bennie L. Parks, Durham, both of N.C., assignors to American Brands, Inc., New York, N.Y.

Filed Dec. 12, 1975, Ser. No. 640,322

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LL **29 Claims**



1. A process for perforating material comprising the steps of:

a. advancing at least a sheet of material along a path of travel,

b. passing the advancing material over a movable laser mask having an aperture such that the material drives the mask in unison with the movement of the material, and

c. directing at least a laser beam through the corresponding aperture so as to vaporize the material juxtaposed the mask aperture to correspondingly form an opening in the material.

4,507,536

BEAM-MACHINING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Apr. 19, 1982, Ser. No. 369,547

Claims priority, application Japan, Apr. 20, 1981, 56-59993

Int. Cl.³ B23K *27/00*

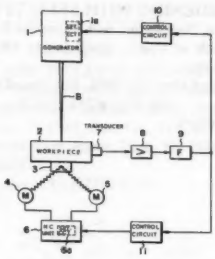
U.S. Cl. 219—121 LB **14 Claims**

1. A method of machining a workpiece composed, especially of a brittle material, with a focused energy beam, comprising the steps of:

irradiating a localized region of the workpiece with the focused energy beam of a predetermined high energy density sufficient to vaporize the material at and thereby dislodge it from said region while permitting an acoustic emission to be in situ generated therefrom;

relatively displacing the energy beam and the workpiece to displace said region of beam irradiation along a prescribed path on a surface of the workpiece at a predetermined rate of displacement, thereby machining the workpiece along said path;

monitoring said acoustic emission to detect a characteristic acoustic signal therein representing development, in said localized region of material dislodgment, of a particular stress which tends to form a defective thermal distortion



or cracking in the workpiece around said region upon vaporization; and

in response to said detected characteristic signal, modifying at least one of said energy density of the beam and said rate of displacement in a manner to assure that said workpiece machined is substantially free from said defective thermal distortion or cracking.

4,507,537

SILENT DISCHARGE-TYPE LASER DEVICE

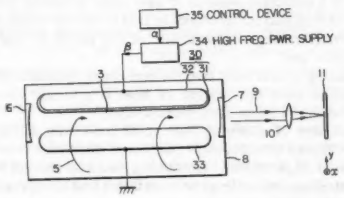
Shigenori Yagi, Kobe; Shuji Ogawa, Nishinomiya; Masaki Kuzumoto, Amagasaki, and Norikazu Tabata, Toyonaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,864

Claims priority, application Japan, May 11, 1981, 56-70558

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LA **5 Claims**



1. A silent discharge-type laser device comprising:

a set of opposing electrodes, at least one of them being a dielectric electrode;

a high-frequency power source which is connected to said set of electrodes and which establishes a silent discharge across said set of electrodes so as to produce a laser beam, said high-frequency power source comprising a DC generating circuit connected to a power source so as to generate a direct current, a high-frequency generating circuit which is connected to an output of said DC generating circuit so as to produce a high-frequency voltage, and a high-frequency transformer which is connected to an output of said high-frequency generating circuit so as to apply a high-frequency voltage across said set of electrodes; and

a control device which is connected to said high-frequency generating circuit and supplies signals to said high-frequency generating circuit so as to control an output voltage of said high-frequency power source, said control device having at least one of a voltage control circuit for

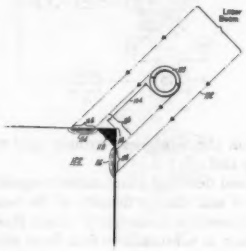
generating signals used to modulate an amplitude of high-frequency output voltage produced by said high-frequency power source and a frequency control circuit for generating signals used to modulate a frequency of said high-frequency output voltage.

4,507,538

LASER HARDENING WITH SELECTIVE SHIELDING

Clyde O. Brown, Newington, and Raymond E. Tourtellotte, East Hartford, both of Conn., assignors to Mostek Corporation, Carrollton, Tex.

Filed Oct. 22, 1982, Ser. No. 436,142
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 L **3 Claims**



1. A method of hardening an edge of a metal object comprising the steps of:

generating at least one source of heat,

applying said at least one source of heat to at least two surface areas disposed on opposite sides of said edge and offset from said edge by a predetermined amount thereby defining a corner including said edge and bounded by said at least two surface areas,

moving said at least one source of heat at a predetermined rate along a predetermined path substantially parallel to said edge, thereby extending said at least two suface areas in a direction parallel to said edge, whereby the temperature of said metal object in said corner is raised to a critical temperature characteristic of the metal of said metal object; and

cooling said at least two surface areas, characterized in that:

said at least one source of heat is a single optical beam, having a beam area, from a laser,

said step of applying heat to at least two surface areas is effected by blocking a portion of said beam area in front of said edge, thereby producing first and second beam areas striking said at least two surface areas on opposite sides of said edge, and

said step of cooling said at least two surface areas is effected by conductive cooling into the bulk of said metal object.

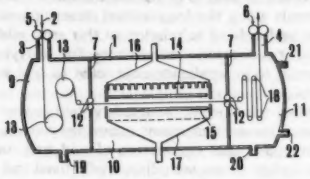
4,507,539

METHOD FOR CONTINUOUS TREATMENT OF A CLOTH WITH THE USE OF LOW-TEMPERATURE PLASMA AND AN APPARATUS THEREFOR

Yoshikazu Sando, Wakayama; Tokuju Goto, Nara; Itsuo Tanaka, Osaka; Hiroshi Ishidoshiro, and Matsuo Minakata, both of Wakayama, all of Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Dec. 28, 1982, Ser. No 453,944
Claims priority, application Japan, Jan. 6, 1982, 57-814; Jan. 6, 1982, 57-815
Int. Cl.³ B23K *9/00*; B05D *3/06*; D06C *1/00*
U.S. Cl. 219—121 PY **4 Claims**

1. A method for continuous treatment of a cloth with the use of low-temperature plasma, comprising drying a cloth to be treated by heating the cloth in a reduced pressure chamber at a pressure between 10 to 100 Torr, and directly transporting the cloth without exposing the cloth to atmospheric pressure through a low-temperature plasma atmosphere in a low-temperature plasma treating chamber at a pressure between 0.1 to 10 Torr and an electric frequency of 1 KHz to 300 MHz.

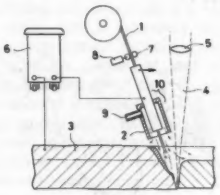


4,507,540

WELDING METHOD COMBINING LASER WELDING AND MIG WELDING

Masanobu Hamasaki, Takamatsu, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,693
Claims priority, application Japan, Oct. 6, 1982, 57-175883
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LD **3 Claims**



1. A welding method, which comprises setting a laser beam source and a MIG welding torch thereby allowing MIG welding first to melt the joint portion of substrates and subsequently enabling the laser beam to be focused near the bottom surface of a crater dug to a great depth by the impulsive force of molten metal particles and the force of arc plasma stream to attain the welding with deep penetration.

4,507,541

MEASURING PROXIMITY OF METAL TO AN ARC WELDING TORCH

Remy D. Fourre, Mountain View, and William A. Grant, Sunnyvale, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Jan. 13, 1984, Ser. No. 570,713
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—124.34 **9 Claims**

1. Apparatus for measuring the distance between an electric welding torch and a material being welded, for use with an electric torch having a consumable electrode adjacent the material being welded with a welding arc being established between an end of said consumable electrode and said material being welded, said apparatus comprising:

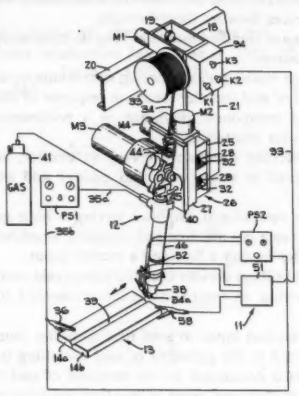
an auxiliary electrode;

means for mounting said auxiliary electrode adjacent said consumable electrode with said auxiliary electrode electrically isolated from said consumable electrode;

an electrical power supply;

means for mounting an end of said auxiliary electrode adjacent said end of said consumable electrode to establish an auxiliary arc between said auxiliary electrode and said

material when a voltage is applied to said auxiliary electrode, said auxiliary arc combining with said welding arc; and



means for connecting said auxiliary electrode to said power supply to provide a voltage on said auxiliary electrode representative of the distance between said auxiliary electrode and said material being welded.

4,507,542

IMPULSE WELDING DEVICE FOR GAS SHIELDED ARC WELDING

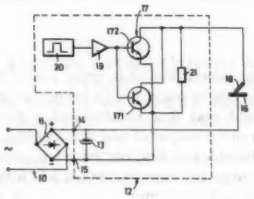
Werner Kunz, Duesseldorf, and Theo Broeckels, Krefeld, both of Fed. Rep. of Germany, assignors to Kohlensaeurewerk GmbH, Bad Hoenningen, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,585

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217093

Int. Cl.³ B23K *9/09*

U.S. Cl. 219—130.51 **12 Claims**



1. An impulse welding device suitable for gas-shielded arc welding in connection with a direct current power source, comprising:

a welding electrode;

a first current path comprising a transistor circuit supplied by said power source and including a plurality of power transistors, said transistor circuit connected to said welding electrode for providing an arc welding current thereto;

an impulse generator for periodically driving the power transistors of said transistor circuit between a low conduction state and a high conduction state such that a pulsating arc welding current having high and low amplitudes, is provided to said welding electrode; and

a second current path comprising at least one substantially pure ohmic resistor having negligible inductive reactance connected in parallel with said plurality of power transistors and connected in series with said direct current power source and said welding electrode, said ohmic resistor comprising a bifilar winding,

said first current path and said second current path being free of any substantial inductive reactance,

whereby said low amplitude current of said pulsating arc welding current is passed through said ohmic resistor at least when said plurality of said transistors are in the low conduction state.

4,507,543

PULSE ARC WELDING METHOD

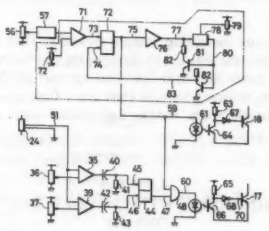
Jun Ukai, and Takao Shimizu, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,757

Claims priority, application Japan, Nov. 10, 1980, 55-157963; Nov. 10, 1980, 55-157962

Int. Cl.³ B23K *9/09*

U.S. Cl. 219—137 PS **5 Claims**



1. In a pulse arc welding method of the type wherein a welding current is applied between a base material and a wire electrode which may be moved relative to said base material, said welding current comprising a base current level upon which is periodically superimposed a current pulse, said current pulse having a waveform defined by its pulse width, and its amplitude in excess of said base current level, the improvement comprising the steps of: setting said current pulse amplitude and said pulse width and said base current level to particular values defining an optimum current pulse waveform; said base current level being set to a value which allows an arc to be maintained regardless of a frequency of said pulse; and, varying the average value of said welding current while maintaining a constant current pulse waveform by varying the frequency of the current pulses superimposed on said base current level, said frequency varying step comprising increasing the current pulse frequency when said electrode is stationary with respect to said base material and decreasing said frequency when said electrode moves with respect to said base material.

4,507,544

BURN-IN CLOCK MONITOR

Daniel P. Jones, Houston, Tex., assignor to Reliability, Inc., Houston, Tex.

Filed Sep. 29, 1982, Ser. No. 426,767

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—209 **10 Claims**

1. Burn-in apparatus comprising

a burn-in chamber having a wall,

means including electric connectors on both an inside and outside of the wall for transmitting electricity through the wall,

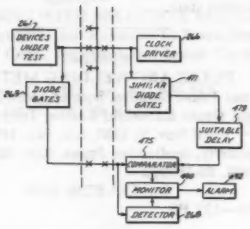
burn-in boards releasably connected to one of said electrical connectors on the inside of the wall,

clock boards releasably connected to said connectors on the outside of the wall,

monitor boards releasably connected to one of said electrical connectors on the outside of the wall,

first diode gate means on the burn-in boards and in communication with said monitor boards, and

second diode gate means on the burn-in boards in parallel with said first diode gate means, said second diode gate means performing a logical function distinct from said first diode gate means,



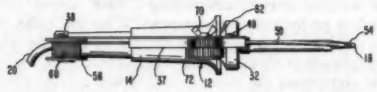
said apparatus including means whereby said clock boards supply electric signals to devices on the burn-in boards to exercise same and said first and second diode gate means supply monitoring signals that are a function of the clock signals to detector means associated with said monitor boards.

4,507,545

SOLDERING IRON WITH SOLDER DISPENSING DEVICE

James F. Riordan, 1859 Andrews Ave., San Jose, Calif. 95124

Filed Dec. 7, 1981, Ser. No. 328,830
Int. Cl.³ B23K 3/06; H05B 1/00
U.S. Cl. 219—230 **7 Claims**



1. A solder dispensing device for a soldering iron having a handle and a soldering tip comprising: an elongated support; means coupled with the support at a pair of spaced locations thereon for rigidly mounting the support on the handle of the soldering iron with the support extending longitudinally of and adjacent to the handle; a spool of solder wire mounted on the support near one end thereof for rotation with respect thereto, the support having a passage therethrough extending between the ends thereof for receiving the solder wire from the spool and directing the solder wire along a predetermined path to a location near the tip of the soldering iron when the support is on the handle of the soldering iron, said passage having an opening intermediate its ends to expose a segment of the solder wire extending through the passage; and wheel means adjustably mounted in a fixed position on the support between said locations for normally drivingly engaging said solder wire segment and for advancing the solder wire along said path.

4,507,546

CONTROL CIRCUIT RESPONSIVE TO A COMPONENT'S VARYING RESISTANCE

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265, and Wayne A. Murray, 13117 Sierra Hwy., Saugus, Calif. 91350

Filed Mar. 1, 1983, Ser. No. 471,173
Int. Cl.³ H05B 1/02
U.S. Cl. 219—497 **12 Claims**

1. An electronic control circuit for controlling the power applied to an electric component, the resistance of which varies with the power flowing therethrough, said circuit comprising:

(a) an alternating current source;

(b) an electric component having a resistance varying with the power flowing therethrough;

(c) full wave rectifier means having its input coupled across said source;

(d) switch means for connecting said component across the output of said rectifier means in response to the resistance of said component deviating in a predetermined sense from a set resistance;

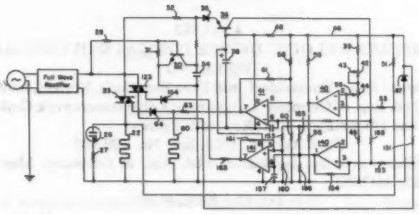
(e) a switching transistor, having an emitter, and a diode connected in series with said emitter and said rectifier means

(f) a first operational amplifier having a high gain and arranged as a comparator and summing amplifier, said first amplifier having a first and a second input;

(g) a first voltage divider coupled across said rectifier means and having an intermediate tap connected to said first input;

(h) said second input to said first amplifier being directly connected to the collector of said switching transistor;

(i) a resistor connected to one terminal of said component and to said second input of said first amplifier to receive a current indicative of the resistance of said component



when said switch means is open, and said second input being coupled to one arm of a bridge including said component and said first resistor and a positive feedback means from the output of said first amplifier to said second input, whereby said first amplifier has a low output when the voltage at said second input is less than the reference voltage at said first input;

(j) a second operational amplifier having a relatively low gain and having a first and a second input, said second input being directly connected to the output of said first amplifier;

(k) a second voltage divider connected across said rectifier means, said voltage divider being connected to said first input of said second amplifier;

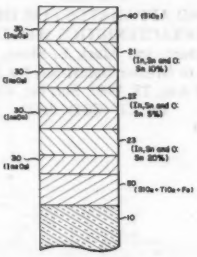
(l) a third voltage divider coupled across said rectifier means and having an intermediate point connected to the output of said first amplifier and to the second input of said second amplifier; and

(m) a time constant circuit including a capacitor and said third voltage divider, said time constant circuit being connected to said second input of said second amplifier, whereby said second amplifier operates as a monostable multivibrator, the output of said second amplifier being connected to said switch means to permit conduction thereof upon occurrence of said zero voltage crossing signal for a period of time of a cycle of the input wave.

4,507,547
HEAT WAVE SHIELDING LAMINATION

Yasunori Taga, and Yutaka Sawada, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 25, 1983, Ser. No. 498,091
Claims priority, application Japan, Jun. 1, 1982, 57-93873
Int. Cl.[3] H05B 3/16
U.S. Cl. 219—543 10 Claims

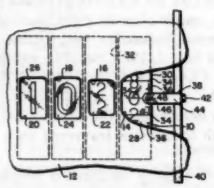


1. A heat wave shielding lamination comprising a visible light transparent substrate and an overlying composite lamination consisting of at least one first electrically conductive layer formed of indium tin oxide and at least one second electrically conductive layer formed of In_2O_3 arranged alternately on top of one another, said first and second layers having approximately the same refractive indexes in the visible light range in order to get good transmittance to visible light but having different refractive indexes in the infrared spectrum against which shielding is desired, said first layer having a thickness of about $\lambda/4n_A$ (where λ stands for the wavelength at the center of said infrared spectrum and n_A stands for the refractive index at the wavelength λ) and said second layer having a thickness of about $\lambda/4n_B$ (where λ stands for the wavelength at the center of said infrared spectrum and n_B stands for the refractive index at the wavelength λ), whereby said first and second layers together exhibit shielding effect against infrared rays in the infrared spectrum by interferential reflection of such rays.

4,507,548
INDICATOR ASSEMBLY FOR USE WITH NUMBER WHEEL

Thomas G. McGee, Simsbury, and Richard L. Hockmuth, Avon, both of Conn., assignors to Petroleum Meter & Pump Co., Ind., Avon, Conn.

Filed May 19, 1983, Ser. No. 496,081
Int. Cl.[3] G06C 15/42; B67D 5/22
U.S. Cl. 235—94 R 9 Claims

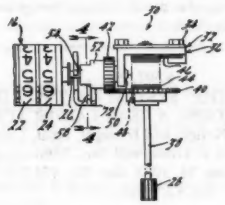


1. In a fuel pump mechanism having supporting frame means and a sale price display assembly, including a bank of number wheels rotatably mounted on said frame means, the improvement comprising: a lowest digit number wheel in said bank having a multiplicity of relatively long graduation marks spaced equidistantly about the circumferential surface and extending substantially to at least one side edge thereof, and having a multiplicity of relatively short graduation marks on said circumferential surface interposed between said relatively long marks and extending substantially to said one side edge and short of the opposite side edge thereof; a face plate disposed over said bank of wheels and having a window through which is normally visible a limited area of said circumferential surface of said lowest digit wheel and said relatively long and relatively short graduation marks thereon; an indicator member disposed adjacent said window and having index means positioned in front of said lowest digit wheel for registry with said relatively long and relatively short graduation marks; and strip means, of a width substantially equal to the length of said relatively short graduation marks, adapted for selective mounting across said window to extend perpendicularly to the axis of rotation of said wheels and at a suitable position for masking said relatively short graduation marks on said lowest digit number wheel, whereby said indicator member can be selectively employed to normally index said relatively long and said relatively short graduation marks, or to index only long graduation marks with said masking means so mounted in said suitable position.

4,507,549
ODOMETER RESET MECHANISM

Nelson W. Secord, Brighton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 18, 1984, Ser. No. 621,775
Int. Cl.[3] G01C 22/00; G06C 15/42
U.S. Cl. 235—96 3 Claims



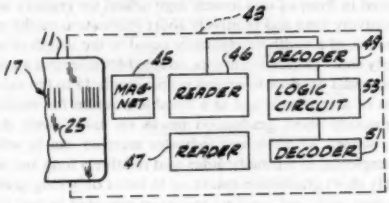
1. An odometer reset mechanism adapted to turn an odometer reset shaft through an angular distance greater than 360° comprising a manually turnable drive shaft drivingly connected to an odometer reset shaft, a first ring fixedly mounted on the odometer reset shaft to turn therewith, a second ring mounted on the odometer reset shaft adjacent to the first ring, said second ring being freely rotatable on the odometer reset shaft, a stop arm extending radially outwardly from said second ring, a tooth extending axially outwardly from said first ring into the plane generated by the stop arm upon rotation of the second ring whereby the tooth will engage the stop arm upon rotation of the first ring, a member having a stop surface positioned in abutting relationship to said stop arm, said stop arm abutting said stop surface upon rotation of the second ring through an arc of less than 360° in either the clockwise or counterclockwise direction, one of said abutting positions defining a start position and the other of said abutting positions defining a reset position, said tooth being rotatable in either the clockwise or counterclockwise direction through an arc of 360° less the angle defined by the width of the stop arm before contacting the stop arm, whereby upon rotation of said drive shaft, the odometer reset shaft may be rotated a distance equal to the arc of rotation of the tooth prior to its contacting the stop arm plus the arc of rotation of the stop arm prior to its contacting the stop surface, the sum of said two arcs being greater than 360°.

4,507,550

HIGH SECURITY CREDIT CARD, SYSTEM AND METHOD

Thomas P. Fleer, St. Louis, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed May 13, 1983, Ser. No. 494,344
Int. Cl.[3] G06K 7/08
U.S. Cl. 235—449 19 Claims



1. A credit card capable of having erasable credit indicia imprinted thereon, said card comprising:

a non-magnetic substrate;

a first strip extending in a first direction along the substrate, said first strip comprising a predetermined series of permanently magnetic lines, said lines defining positions along the first strip and being detectable by a magnetic reader, said predetermined series being disposed on the substrate with at least a pseudo-random starting point; and

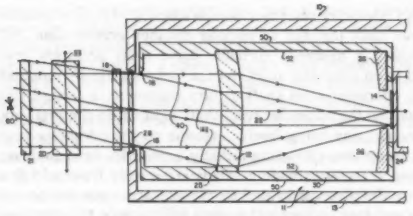
a second strip of temporarily magnetizable material extending along the substrate generally parallel to the first strip, said magnetizable material being adapted to have erasable credit indicia imprinted thereon at locations along its longitudinal axis, the credit indicia being erasable by a strong magnetic field.

4,507,551

OPTICAL DETECTION SYSTEM HAVING A DETECTOR LENS COMPRISING A REAR LANDSCAPE LENS

James W. Howard, Natick, and Irving R. Abel, Lexington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 14, 1983, Ser. No. 474,774
Int. Cl.[3] H01J 3/14
U.S. Cl. 250—216 10 Claims



1. An optical system for scanning a large detector array over a wide field of view within a desired scene of interest, said system having an optical axis and comprising:

A. a cryogenically cooled vessel ("dewar") located substantially along said optical axis;

B. imaging lens means located within said dewar and substantially along said optical axis;

C. an optical detection means located within said dewar and substantially at the position of best focus of said imaging lens means along said optical axis, said detection means having a plurality of detecting elements;

D. an aperture stop located within said dewar and substantially along said optical axis between said imaging lens means and said scene of interest such that the diameter of the bundle of light rays from said scene of interest is limited by said aperture stop; and

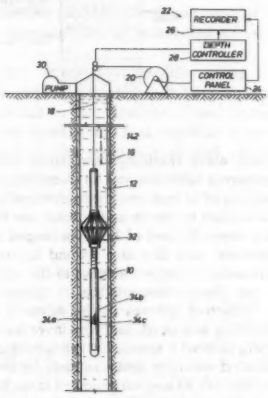
E. wherein the location of said aperture stop enables the use of an optical scanning device located between said aperture stop and said scene of interest, close to said aperture stop thereby minimizing the size of optical elements within said scanning device.

4,507,552

METHOD AND APPARATUS FOR DETERMINING FLOW CHARACTERISTICS WITHIN A WELL

Raymond E. Roesner, and Mark L. Sloan, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 23, 1982, Ser. No. 410,276
Int. Cl.[3] G01V 5/00
U.S. Cl. 250—259 11 Claims



1. A well logging apparatus for determining characteristics of fluid flow within a well, comprising:

a body member adapted to traverse a well;

means mounted on said body member for collecting and accelerating along a defined flow path at least a portion of the fluid flow within said well;

means for releasing a quantity of tracer element into and parallel with said collected and accelerated fluid flow; and

means for detecting said tracer element along said defined flow path.

4,507,553

METHOD AND APPARATUS FOR IDENTIFYING VANADIUM IN EARTH FORMATIONS

Donald W. Oliver, and Walter H. Fertl, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 1, 1982, Ser. No. 413,924
Int. Cl.[3] G01V 5/10; G01N 23/222
U.S. Cl. 250—270 3 Claims

1. A method for determining the concentrations of vanadium in subsurface earth formations traversed by a borehole, comprising:

lowering a well logging instrument housing a source of neutrons and a gamma ray detector to a location within said borehole;

irradiating said subsurface earth formations adjacent said source with neutrons for a time period sufficient to cause activation of vanadium;

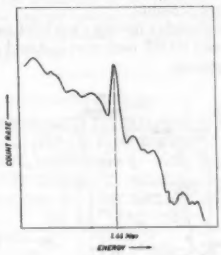
said time period being at least approximately equal to the half-life of the characteristic gamma ray of vanadium, said time period being at least approximately twenty minutes;

repositioning said well logging instrument within said bore-

hole so that said detector is adjacent said irradiated earth formations;

dectecting gamma radiation emanating from said earth formations;

generating electrical pulse signals representative of said detected gamma radiation;



measuring the electrical pulse signals within an energy range from between 1.30 Mev to 1.60 Mev;

converting said measured electrical pulse signals within said energy range into a d.c. signal; and

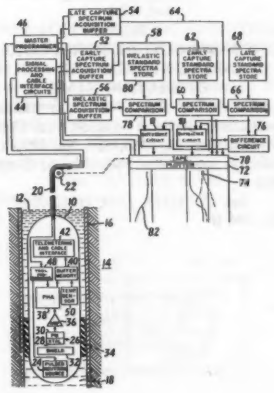
recording said d.c. signal in correlation with the depth within said borehole of said irradiated earth formations.

4,507,554

METHOD AND APPARATUS FOR DETERMINING BOREHOLE AND FORMATION CONSTITUENTS

Russel C. Hertzog, Jakarta, Indonesia, and William B. Nelligan, Danbury, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,162
Int. Cl.³ G01V *5/10*
U.S. Cl. 250—270 **16 Claims**



1. A method of determining the composition of material adjacent a well-logging sonde positioned in a well-bore traversing a subterranean formation comprising the steps of:

bombarding said material and said formation with high energy neutrons from said sonde;

detecting gamma rays emanating from said material and said formation and generating a detection signal representative of said gamma rays;

generating from said detection signal a combined formation-material determination signal representative of the composition of said material and said subterranean formation;

generating from said detection signal a formation determination signal representative of the composition of said subterranean formation; and

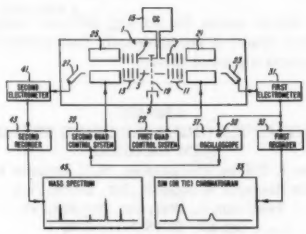
comparing said combined formation-material determination signal with said formation determination signal to generate a determination signal solely representative of the composition of said material adjacent said sonde.

4,507,555

PARALLEL MASS SPECTROMETER

Chang Chang, 3065 Maginn Dr., Xenia, Ohio 45385

Filed Mar. 4, 1983, Ser. No. 472,161
Int. Cl.³ B01D *59/44*
U.S. Cl. 250—281 **42 Claims**



1. A chromatograph-mass spectrometer chemical analysis method including the following steps during a chromatograph-mass spectrometer experiment:

A. transmitting a sample from a chromatograph into a mass spectrometer equipped with ion generation means, ion direction means, a first mass resolution device, a second mass resolution device, ion detection means and operation means,

B. generating ions of the sample in the mass spectrometer,

C. simultaneously and separately directing a first portion of the ions into the first mass resolution device and directing a second portion of the ions into the second mass resolution device,

D. operating the first mass resolution device for obtaining a chromatogram,

E. detecting the ions emerging from the first mass resolution device and yielding a first output signal,

F. automatically sensing the time during which the first output signal corresponds to the appearance of a chromatographic peak,

G. operating the second mass resolution device and detecting the ions emerging from the second mass resolution device, which yields a second output signal and producing a mass spectrum from the second output signal,

H. automatically controlling at least a portion of the Step G operation in accordance with the time information sensed.

4,507,556

APPARATUS AND METHOD FOR DETERMINING PULP STOCK CONSISTENCY

Irving R. Brenholdt, Stratford, Conn., assignor to St. Regis Paper Company, West Nyack, N.Y.

Filed Dec. 8, 1982, Ser. No. 448,040
Int. Cl.³ G01N *21/51*
U.S. Cl. 250—341 **20 Claims**

1. Apparatus for measuring the percentage of solid particles in a suspension comprising:

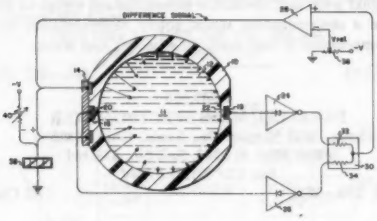
a chamber for containing a suspension to be measured;

a radiant energy source;

means for diffusing radiant energy from said source and introducing the diffused energy into said chamber;

first sensor means for sensing diffused energy in said cham-

ber which is predominantly forwarded-scattered when a suspension is present therein; and



second sensor means for sensing diffused energy in said chamber which is predominantly back-scattered when a suspension is present therein.

4,507,557

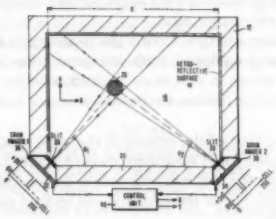
NON-CONTACT X,Y DIGITIZER USING TWO DYNAMIC RAM IMAGERS

Constantine J. Tsikos, Pennsauken, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Apr. 1, 1983, Ser. No. 468,104

Int. Cl.³ G01S *5/16, 7/50*

U.S. Cl. 250—341 **21 Claims**



1. Apparatus for detecting the position of an object within a viewing field, said apparatus comprising, in combination:

(a) a first, substantially point source of radiation disposed at a first location on the perimeter of said viewing field and arranged to illuminate said viewing field with radiation;

(b) a retro-reflective surface disposed around said perimeter and arranged to reflect radiation received from an originating source back toward said originating source; and

(c) first means, disposed on said perimeter adjacent to said first source, for receiving the radiation reflected by said retro-reflective surface and for sensing a first direction at which radiation originating from said first source is interrupted by an object located within said viewing field.

4,507,558

SELECTIVE LEAK-DETECTOR FOR NATURAL GAS

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1983, Ser. No. 468,266

Int. Cl.³ G01F *1/74;* G01J *5/58*

U.S. Cl. 250—345 **7 Claims**

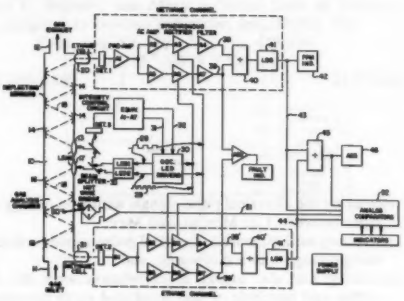
1. A selective detector apparatus of natural gas and of other combustible gases which is designed to distinguish between natural gas on the one hand, which is composed principally of a mixture of methane and ethane having a ratio between 100:1 and 20:1, and on the other hand other combustible gases such as methane, ethane, CO, H_2, gasoline vapors, propane or others, the apparatus comprising:

an NDIR detector channel sensitive to methane gas and providing a first output signal which varies as a function of the concentration of methane gas;

an NDIR detector channel sensitive to ethane gas and providing a second output signal which varies as a function of the concentration of ethane gas;

a non-specific combustible detector sensitive to combustible gases and providing a third output signal when combustible gases are present;

a gas analysis chamber having a gas inlet and a gas outlet and including said NDIR detectors and said non-specific combustible detector;



first ratio determining means receiving said first and second signals and providing a ratio output signal indicating the ratio of methane to ethane;

first comparator means indicating the presence of natural gas when said first ratio falls in the range between 100:1 and 20:1;

and further comparator means receiving said first and third output signals and said ratio signal to provide an indicator of and identity of other combustible gases or H_2 or CO.

4,507,559

DEFLECTION STRUCTURE FOR A CORPUSCULAR BEAM BLANKING SYSTEM AND METHOD FOR OPERATING SAME

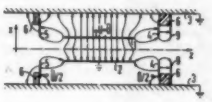
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,482

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1982, 3227426

Int. Cl.³ G21K *1/08;* H01J *3/14*

U.S. Cl. 250—396 R **7 Claims**



1. A deflection structure for a corpuscular beam blanking system comprising:

first and second deflection electrodes disposed on opposite

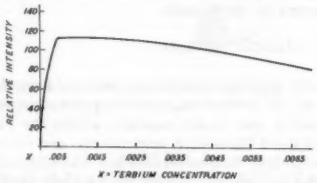
sides of said corpuscular beam, said first deflection electrode being supplied with a chronologically varying potential and said second deflection electrode being supplied with a chronologically constant potential to provide for an asymmetric wired deflection means; and

a plurality of auxiliary electrodes respectively disposed at the input and at the output of said deflection electrodes viewed in the direction of corpuscular beam travel for reducing the energy spread of said corpuscular beam, said auxiliary electrodes being respectively supplied with a static voltage value.

4,507,560
TERBIUM-ACTIVATED GADOLINIUM OXYSULFIDE X-RAY PHOSPHOR

James E. Mathers, and Ramon L. Yale, both of Ulster, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,415
Int. Cl.[3] H01J *1/62*
U.S. Cl. 250—483.1 4 Claims

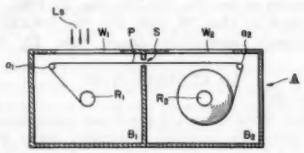


1. An X-ray phosphor having high emission in the blue region of the color spectrum with relatively low persistence, having the formula $(Gd_{1-x}Tb_x)_2O_2S$, wherein x is within the range of about 0.0003 to about 0.0045, and wherein persistence causing impurity ions are below about 5 parts per million parts by weight of the phosphor.

4,507,561
PROCESS FOR ACCUMULATING AND STORING LIGHT ENERGY AND RELEASING THE SAME THEREFROM FOR UTILIZATION

Toshio Sugita, 17-12, Takamatsu-cho 2-chome, Tachikawa-shi, Tokyo, and Masahide Kamiyama, 24, Naka-cho, Shinjuku-ku, Tokyo, both of Japan

Filed Sep. 19, 1980, Ser. No. 188,868
Claims priority, application Japan, Sep. 21, 1979, 54-120836
Int. Cl.[3] H05B *33/00*
U.S. Cl. 250—484.1 3 Claims



1. A process for accumulating and storing light energy in light absorbing matter and releasing the same therefrom for utilization comprising the steps of:

irradiating a light absorbing matter by light ranging from ultraviolet to infrared light causing said matter to be raised to an excited high energy state;

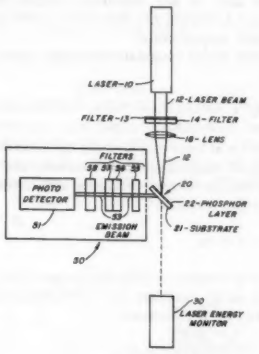
maintaining the temperature of said matter at a predetermined value equal to or lower than −50° C., thereby locking in said high energy state of said light absorbing matter produced by said irradiation; and

releasing said energy thus absorbed, therefrom, by changing said predetermined temperature value to a temperature equal to or higher than room temperature at a desired instant.

4,507,562
METHODS FOR RAPIDLY STIMULATING LUMINESCENT PHOSPHORS AND RECOVERING INFORMATION THEREFROM

Jean Gasiot, 27 LeClos, 34960 Clapiers, Herault, France; Peter F. Braunlich, SW. 730 City View, Pullman, Wash. 99163, and Jean P. Fillard, 132 Rue du juge, 34980 St. Gely du Fesc, Herault, France

Continuation-in-part of Ser. No. 197,914, Oct. 17, 1980, abandoned. This application Feb. 28, 1983, Ser. No. 470,633
Int. Cl.[3] G01T *1/105*
U.S. Cl. 250—484.1 17 Claims



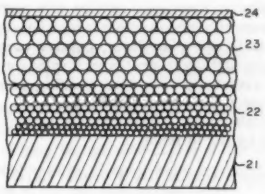
1. A method for rapidly and optically stimulating luminescent phosphors to cause luminescent energy previously stored in the luminescent phosphors to be rapidly released, comprising:

directing an intense beam of photons from a laser at the luminescent phosphor for a period of time less than one millisecond and with a photon flux density of at least 5×10^{19} photons per second and per square millimeter; said beam of photons having a wavelength approximately equal to the stimulation wavelength for the phosphor.

4,507,563
RADIOGRAPHIC IMAGE CONVERSION SCREENS

Hidehiko Maeoka, Takaido-Higashi; Etsuo Shimizu, Tokyo; Yujiro Suzuki, Odawara; Keiji Shimiya, Hiratsuka, and Norio Miura, Isehara; all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Continuation of Ser. No. 376,020, May 7, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 627,502
Claims priority, application Japan, Mar. 15, 1982, 57-39310
Int. Cl.[3] H01J *1/68, 1/62*
U.S. Cl. 250—486.1 8 Claims



1. A radiographic image conversion screen, having a speed

and/or an image quality at least equal to that of a conventional radiographic image conversion screen which has only a green emitting rare earth phosphor layer, consisting essentially of: (a) a support; (b) a first fluorescent layer formed on said support and consisting essentially of a blue emitting phosphor which is selected from the group consisting of:

(I) an alkaline earth metal complex halide phosphor represented by the formula:

$$MeF_2{\cdot}pMe'X'_2{\cdot}qKX'{\cdot}rMe''SO_4{:}mEu^{2+},nTb^{3+}$$

where Me is at least one element selected from the group consisting of magnesium, calcium, strontium and barium, each of Me' and Me'' being at least one element selected from the group consisting of calcium, strontium and barium, each of X and X' being at least one element selected from the group consisting of chlorine and bromine, and p, q, r, m and n are numbers within the ranges of $0.80 \leqq p \leqq 1.5$, $0 \leqq q \leqq 2.0$, $0 \leqq r \leqq 1.0$, $0.001 \leqq m \leqq 0.10$ and $0 \leqq n \leqq 0.05$, respectively;

(II) a divalent metal tungstate phosphor represented by the formula:

$$M^{II}WO_4$$

where M^{II} is at least one element selected from the group consisting of magnesium, calcium, zinc and cadmium;

(III) a zinc sulfide or zinc-cadmium sulfide phosphor represented by the formula:

$$(Zn_{1-j}, Cd_j)S{:}Ag$$

where j is a number within the range of $0 \leqq j \leqq 0.4$; and

(IV) a rare earth tantalate or tantalum-niobate phosphor represented by the formula:

$$(Ln''_{1-v}Tm_v)(Ta_{1-w},Nb_w)O_4$$

where Ln'' is at least one element selected from the group consisting of lanthanum, yttrium, gadolinium and lutetium, and v and w are numbers within the ranges of $0 \leqq v \leqq 0.1$ and $0 \leqq w \leqq 0.3$, respectively; and (c) a second fluorescent layer formed on said first fluorescent layer and consisting essentially of a green emitting rare earth oxysulfide phosphor represented by the formula:

$$(Ln_{1-a-b}Tb_a,Tm_b)_2O_2S$$

where L is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and a and b are numbers within the ranges of $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively, or the formula:

$$(Y_{1-i-a-b}Ln_i,Tb_a,Tm_b)_2O_2S$$

where Ln is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and i, a and b are numbers within the ranges of $0.65 \leqq i \leqq 0.95$, $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively.

8. A method of obtaining a radiographic image of a subject with a radiographic apparatus, comprising: obtaining a radiographic image of said subject with said radiographic device in which the image conversion screen, having a speed and/or an image quality at least equal to that of a conventional radiographic image conversion screen which has only a green emitting rare earth phosphor layer, consists essentially of: (a) a support; (b) a first fluorescent layer formed on said support and consisting essentially of a blue emitting phosphor which is selected from the group consisting of:

(I) an alkaline earth metal complex halide phosphor represented by the formula:

$$MeF_2{\cdot}pMe'X'_2{\cdot}qKX'{\cdot}rMe''SO_4{:}mEu^{2+},nTb^{3+}$$

where Me is at least one element selected from the group consisting of magnesium, calcium, strontium and barium, each of Me' and Me'' being at least one element selected from the group consisting of calcium, strontium and barium, each of X and X' being at least one element selected from the group consisting of chlorine and bromine, and p, q, r, m and n are numbers within the range of $0.80 \leqq p \leqq 1.5$, $0 \leqq q \leqq 2.0$, $0 \leqq r \leqq 1.0$, $0.001 \leqq m \leqq 0.10$ and $0 \leqq n \leqq 0.05$, respectively,

(II) a divalent metal tungstate phosphor represented by the formula:

$$M^{II}WO_4$$

where M^{II} is at least one element selected from the group consisting of magnesium, calcium, zinc and cadmium;

(III) a zinc sulfide or zinc-cadmium sulfide phosphor represented by the formula:

$$(Zn_{1-j}Cd_j)S{:}Ag$$

where j is a number within the range of $0 \leqq j \leqq 0.4$; and

(IV) a rare earth tantalate or tantalum-niobate phosphor represented by the formula:

$$(Ln''_{1-v}Tm_v)(Ta_{1-w},Nb_w)O_4$$

where Ln'' is at least one element selected from the group consisting of lanthanum, yttrium, gadolinium and lutetium, and v and w are numbers within the ranges of $0 \leqq v \leqq 0.1$ and $0 \leqq w \leqq 0.3$, respectively; and (c) a second fluorescent layer formed on said first fluorescent layer and consisting essentially of a green emitting rare earth oxysulfide phosphor represented by the formula:

$$(Ln_{1-a-b}Tb_a,Tm_b)_2O_2S$$

where Ln is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and a and b are numbers within the ranges of $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively, or the formula:

$$(Y_{1-i-a-b}Ln_i,Tb_a,Tm_b)_2O_2S$$

where Ln is at least one element selected from the group consisting of lanthanum, gadolinium and lutetium, and i, a and b are numbers within the ranges of $0.65 \leqq i \leqq 0.95$, $0.0005 \leqq a \leqq 0.09$ and $0 \leqq b \leqq 0.01$, respectively.

4,507,564

SURFACE DEFECT DETECTING APPARATUS

Masayoshi Shimada, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 306,238, Sep. 28, 1981,. This application Mar. 29, 1984, Ser. No. 594,430

Claims priority, application Japan, Sep. 27, 1980, 55-137391[U]

Int. Cl.³ G01N *21/89*

U.S. Cl. 250—563 **2 Claims**

1. A surface defect detecting apparatus comprising:

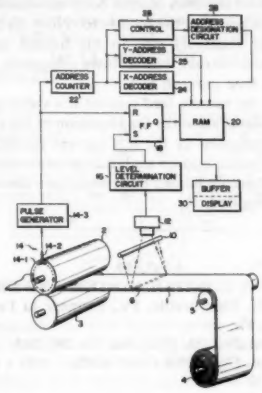
scanning means for scanning a member under inspection transferred by at least one roll at a fixed period in the width direction of the member to successively produce signals representing a surface condition of the member under inspection in the width thereof;

a defect signal generating circuit for producing output signals representing the presence or absence of surface defects on the surface of the member under inspection in accordance with the presence or absence of output signals from said scanning means;

a pulse generating circuit for producing a plurality of output pulses with every rotation of said roll; and

display means responding to the respective output pulses from said pulse generating circuit for displaying said output signals from said defect signal generating circuit,

wherein all the output signals generated from said defect signal generating circuit during one rotation of said roll



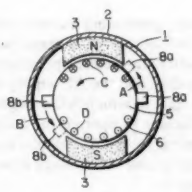
are displayed on a single line and a plurality of these lines is displayed in parallel fashion.

4,507,565

METHOD FOR STARTING AN ELECTRIC STARTING MOTOR ADAPTED FOR STARTING AN INTERNAL COMBUSTION ENGINE

Isao Hamano, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed May 12, 1983, Ser. No. 494,074
Claims priority, application Japan, May 20, 1982, 55-87081
Int. Cl.[3] F02N *11/00*
U.S. Cl. 290—38 R **4 Claims**



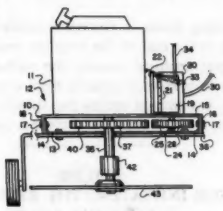
4. An electric motor for starting an internal combustion engine having a ring gear, said electric motor comprising a cylindrical yoke, a permanent magnet secured to the inner peripheral surface of said cylindrical yoke, an armature having a rotary output shaft and an armature winding and mounted in said yoke in a relation facing said permanent magnet, a commutator mounted to said rotary output shaft of the armature and connected to said armature winding, brush means slidingly connected with the outer peripheral surface of said commutator and supplying current to said armature winding, an overrunning clutch, said output shaft having a helically splined portion splinedly connected with said overrunning clutch, a first pinion carried by said output shaft and rotationally coupled to said overrunning clutch only in one direction of rotation of said output shaft, said pinion engaging said ring gear of the internal combustion engine when said clutch is shifted towards an end of said output shaft, a sector gear formed in a brush base secured to said brush means, said sector gear being an internal gear, a D.C. motor having a main output shaft, a second pinion formed on said main output shaft of said D.C. motor, said second pinion engaging said sector gear, a changeover switch for switching between normal and reverse operations of said D.C. motor, control means for said changeover switch, a key switch for initiating the operation of said control means, and a battery for supplying current through a closed electrical circuit formed by said D.C. motor, changeover switch, control means and by said key switch, whereby, until the time said first pinion meshes with said ring gear, said brush means are shifted by said control means and the D.C. motor away from said neutral axis towards the sides of the poles of the permanent magnet where the main magnetic field produced by said permanent magnet is strengthened by the armature-reaction magnetic fluxes for delivering a controlled output to said first pinion and said ring gear, and, after said first pinion is engaged with said ring gear, said brush means are returned to their positions situated on said neutral axis through operation of said control means, changeover switch and said D.C. motor.

4,507,566

STARTER ASSEMBLY FOR GASOLINE ENGINES

Ralph W. Leatherman, and Boyce Leatherman, both of 710 Sherrill Ave., Lincolnton, N.C. 28092

Continuation-in-part of Ser. No. 484,850, Apr. 14, 1983,. This application May 26, 1983, Ser. No. 498,405
Int. Cl.[3] A01D *35/26*
U.S. Cl. 290—38 R **9 Claims**



1. In a kit, a starter assembly for a gasoline engine having a shaft, said assembly comprising

(a) a driven wheel fixed to the shaft of the gasoline engine for rotation therewith,

(b) an electric motor having a shaft,

(c) a driving wheel fixed to the shaft of the electric motor for rotation therewith,

(d) means for moving the electric motor and its driving wheel toward the gasoline engine and its driven wheel,

(e) said driving wheel and driven wheel being arranged for operative engagement when the electric motor is moved sufficiently close to the gasoline engine,

(f) means connecting the electric motor to a source of electric power after the driving and driven wheels are engaged to rotate said wheels and start the gasoline engine,

(g) means for moving the electric motor and its driving wheel away from the gasoline engine after the gasoline engine has started,

(h) means for disconnecting the electric motor from the source of electric power after the gasoline engine has started,

(i) a housing containing said driving and driven wheels in normally spaced relation,

(j) means for attaching the gasoline engine to the housing,

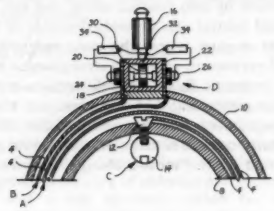
(k) means for attaching the electric motor to the housing in pivotal relation to the gasoline engine, and

(l) means for attaching the housing to an apparatus powered by the gasoline engine.

4,507,567
VECTOR INVERSION GENERATOR

Duane C. Lawson, 8420 Pallux Way, San Diego, Calif. 92126

Filed Jul. 1, 1982, Ser. No. 394,111
Int. Cl.³ H03K 6/00
U.S. Cl. 307—106 10 Claims

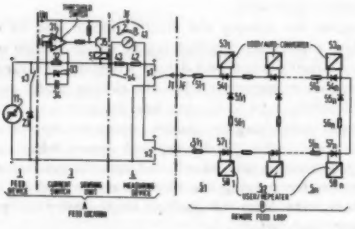


1. A voltage multiplying device comprising:
(a) a tube means,
(b) a stripline means comprising an inner and an outer conductor strip aligned in parallel and separated by a dielectric material, the stripline means being wound about the tube means in such a fashion that the inner conductor makes one complete turn around the tube before the outer conductor starts,
(c) a voltage output terminal means in electrical communication with and disposed at one end of the stripline means, and
(d) a switching means in electrical communication with and disposed at the end of the stripline remote from the voltage output terminal means, the switching means being operable to present a suitably high impedance and a suitably low impedance across the stripline means when the switching means is open and closed, respectively.

4,507,568
DEVICE FOR INITIATING THE REMOTE FEED OF ELECTRICAL USERS

Alfred Ziegler, and Gerhard Musil, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,443
Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216497
Int. Cl.³ H01H 35/00
U.S. Cl. 307—112 12 Claims

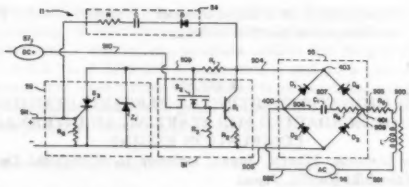


1. A method for safely initiating remote feed of feed current after checking for an interruption to a normally closed remote loop formed of series-connected electrical users by means of dc series feed and by use of a feed device provided in a feed location and containing a dc source, comprising the steps of:
providing a single-side feed of the remote feed loop formed of series-connected electrical users;
providing the feed loop free of devices for automatically closing the feed loop in front of an interrupt location;
providing diodes polarized in a blocking direction for the remote feed current and connected parallel to the users;
providing a loop resistance of the closed loop without interruptions to be less than human body resistance;
checking a resistance of the remote feed loop by providing a test voltage relatively safe to the human body which induces a test current which flows oppositely relative to the remote feed current; and
switching on the remote feed current if a value of said loop resistance identified at the feed location of the remote feed loop as determined by the test current lies below a prescribed test value chosen such that an interruption can be identified even if a human body resistance shunts the loop at the interruption.

4,507,569
ELECTRICAL CONTROL SYSTEM AND DRIVER

John E. Hess, II, Monroeville, Pa., assignor to Conservolite, Inc., Oakdale, Pa.

Filed Dec. 30, 1983, Ser. No. 567,264
Int. Cl.³ H05B 37/00; G05F 1/44
U.S. Cl. 307—130 17 Claims

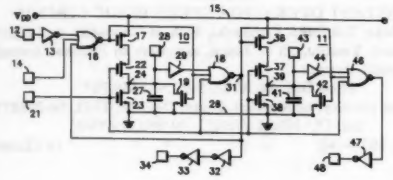


13. In combination with at least one gas discharge lamp having an AC operated ballast transformer, an electrical control system for controlling the application of AC voltage from an AC supply to the primary winding of said ballast transformer comprising:
means for selectively generating a command signal between about 90° and 180° of the AC voltage half wave;
first electronic switching means operatively connected to said primary winding and the AC supply that is capable of assuming a first state in which AC energizing voltage of a level that is sufficient to operate the ballast is applied to the primary winding by the AC supply, and a second state in which said energizing AC voltage is not applied to the primary winding;
second electronic switching means responsive to said command signal, operatively associated with said first electronic switching means for effecting the transition of said first electronic switching means between said first and second states thereof, said second electronic switching means being selectively switchable between a first state in which said second electronic switching means causes said first electronic switching means to assume its said first state, and a second state in which said second electronic switching means causes said first electronic switching means to assume its said second state, said second electronic switching means defining an input adapted to receive said command signals, receipt by said second electronic switching means at said input of a said command signal of a predetermined nature when said second electronic switching means is in its said first state causing said second electronic switching means to leave its said first state to assume its said second state, said second electronic switching means being automatically returned from said second state to said first state when the difference in electric potential between the AC supply and the primary winding is less than a predetermined threshold.

4,507,570
RESETTABLE ONE SHOT CIRCUIT HAVING NOISE REJECTION

John K. Mahabadi, and Victor D. Ehrlich, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 1, 1983, Ser. No. 471,106
Int. Cl.³ H03K 3/033, 3/355
U.S. Cl. 307—273 6 Claims

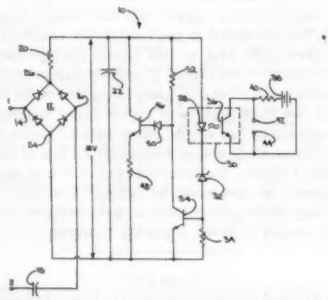


5. A resettable one shot circuit having noise rejection, comprising: an input gate for receiving input signals; first means for providing a first time interval and being coupled to the input gate; a voltage level detector coupled to the first means for providing an output; an output gate coupled to the voltage level detector for providing an output, the output of the output gate being coupled to the input gate to inhibit the input gate whenever the output gate is providing an output; and a reset input coupled to the first means and to the output gate for resetting the one shot circuit.

4,507,571
OPTICALLY COUPLED INPUT CIRCUIT FOR DIGITAL CONTROL

John E. Callan, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 29, 1982, Ser. No. 427,568
Int. Cl.³ H03K 5/20, 5/08
U.S. Cl. 307—278 3 Claims

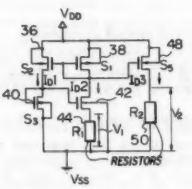


1. An improved a.c. input circuit for converting a sensed a.c. input voltage into a logic level voltage comprising:
- a rectifier having a pair of input terminals for connection to the sensed a.c. voltage and a pair of output terminals across which appears a d.c. voltage which varies in magnitude with the sensed a.c. input voltage;
- a light emitter comprising part of an optical isolator whose conduction state changes when the voltage across said light emitter exceeds a threshold voltage;
- an impedance coupled in series with said light emitter across the output terminals of said rectifier;
- a switchable low impedance circuit path coupled across the light emitter for maintaining a low impedance path thereacross while the sensed a.c. input voltage is below a first predetermined voltage magnitude to keep the voltage across said light emitter below said threshold voltage thereby keeping said light emitter from becoming energized until the sensed a.c. input voltage reaches said first predetermined voltage level so that said light emitter exhibits a sharp turn-on;
- and a switchable high impedance circuit path coupled across said light emitter in parallel with said switchable low impedance circuit path for providing a high impedance circuit path thereacross once the sensed a.c. input voltage reaches said first predetermined voltage magnitude to keep the voltage across said light emitter at or above said threshold voltage so as drive said light emitter into hard conduction and said switchable high impedance circuit path maintaining a high impedance across said light emitter to keep the voltage across said light emitter at or above said threshold voltage until the sensed a.c. input voltage falls to a second predetermined voltage at which voltage said switchable high impedance circuit path becomes nonconductive and said low impedance circuit path becomes conductive to render said light emitter nonconductive so that said light emitter exhibits a sharp turnoff.

4,507,572
VOLTAGE SENSING CIRCUIT

Shingo Hashimoto, and Mitsuo Sekine, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Division of Ser. No. 339,609, Jan. 15, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 618,771
Claims priority, application Japan, Jan. 20, 1981, 56-007019; Jan. 21, 1981, 56-007666
Int. Cl.³ H03K 3/353; G05F 3/08
U.S. Cl. 307—296 R 1 Claim



1. A reference voltage generating circuit, comprising:
- first and second MOS field-effect transistors having the source and substrate electrodes thereof connected in common to a first supply potential, and with the gate electrodes thereof connected in common;
- a third MOS field-effect transistor having the gate and drain electrodes thereof connected in common to the drain electrode of said first MOS field-effect transistor, and the substrate and source electrodes thereof connected in common to a second supply potential;
- a fourth MOS field-effect transistor having the gate electrode thereof connected to the drain electrodes of said first and third MOS field-effect transistors, the drain electrode thereof connected to the drain electrode of said second MOS field-effect transistor, the substrate electrode connected to said second supply potential, and the source electrode thereof connected through a first resistor to said second supply potential;
- a fifth MOS field-effect transistor having the gate electrode thereof connected to the drain electrodes of said second and fourth MOS field-effect transistors, the substrate and source electrodes thereof connected to said first supply potential, and the drain electrode thereof connected to said second supply potential through a second resistor;
- the value of the ratio K of the channel width to channel length of said second MOS field-effect transistor being a predetermined multiple of the ratio of channel width to channel length of said first MOS field-effect transistor,

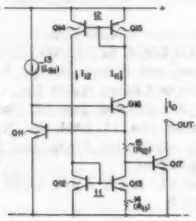
and the ratio of channel width to channel length of said fifth MOS field-effect transistor being a predetermined multiple of the ratio of channel width to channel length of said second MOS field-effect transistor, whereby a reference voltage of amplitude determined by the relative channel dimensions of said first, second and fifth MOS field-effect transistors and by the ratio of the resistance values of said first and second resistors is developed across said second resistor.

4,507,573

CURRENT SOURCE CIRCUIT FOR PRODUCING A SMALL VALUE OUTPUT CURRENT PROPORTIONAL TO AN INPUT CURRENT

Katsumi Nagano, Shimonoseki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1982, Ser. No. 414,911
Claims priority, application Japan, Nov. 6, 1981, 56-178163
Int. Cl.[3] **G05F** *3/08, 3/20;* **H03F** *1/30*
U.S. Cl. 307—297 **4 Claims**



1. A current source circuit comprising:

a first transistor of a first conductivity type with the emitter connected to a first potential point and the collector connected to a second potential point through an input current source;

a second transistor of the first conductivity type with the emitter coupled to the first potential point and the base and collector connected to each other;

a third transistor of the first conductivity type with the emitter coupled to the first potential point and the base connected to the base of said second transistor, said second and third transistors constituting a first current mirror circuit;

a fourth transistor of a second conductivity type with the emitter coupled to said second potential point and the collector connected to the collector of said second transistor;

a fifth transistor of the second conductivity type with the emitter coupled to said second potential point, the base and collector connected to each other and the base connected to the base of said fourth transistor, said fourth and fifth transistors constituting a second current mirror circuit;

means for connecting the emitter of one of said second to fifth transistors to a corresponding potential point through a first resistor;

a sixth transistor of the first conductivity type with the collector connected to the collector of said fifth transistor, the emitter connected to the collector of said third transistor through a second resistor and the base coupled to the collector of said first transistor;

a seventh transistor of the first conductivity type with the emitter connected to said first potential point and the collector connected to an output terminal, from which an output current is provided;

means for connecting one terminal of said second resistor to the base of said first transistor and the other terminal to the base of said seventh transistor; and

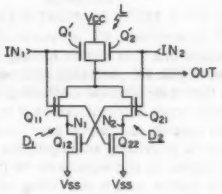
the ratio of the emitter area of said one of the second to fifth transistors having the emitter connected to said first resistor to the emitter area of the transistor constituting a current mirror circuit together with said one of the second to fifth transistors being set to m ($m<1$), said output current being determined by said ratio m and the ratio of the resistance of said second resistor to the resistance of said first resistor.

4,507,574

CONSTANT OPERATION SPEED LOGIC CIRCUIT

Teruo Seki; Takahiko Yamauchi, both of Kawasaki, and Keizo Aoyama, Yamato, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1982, Ser. No. 449,767
Claims priority, application Japan, Dec. 14, 1981, 56-201077
Int. Cl.[3] **H03K** *19/017, 19/094, 19/096*
U.S. Cl. 307—448 **11 Claims**



1. A logic circuit operatively connected to receive input signals, comprising:

a first power supply;

a second power supply having a potential different from that of said first power supply;

N input terminals, N being an integer greater than or equal to two, for receiving respective input signals;

an output terminal;

load means operatively connected between said first power supply and said output terminal; and

N driver circuits, operatively connected in parallel between said second power supply and said output terminal and being cross-coupled to each other, for coupling said output terminal to said second power supply, each of said driver circuits comprising N gates operatively connected in series, each of said N gates being driven by one of the respective input signals of said N input terminals, when the voltage of one of the input signals on one of said N input terminals becomes different from that of the remaining input signals, the potential of only one of said N gates is changed, so that when the voltage of the input signal of said only one of said N gates is again changed, the voltage at the output terminal is quickly changed.

4,507,575

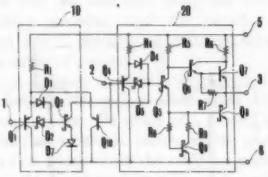
NAND LOGIC GATE CIRCUIT HAVING IMPROVED RESPONSE TIME

Susumu Mori, and Hideaki Yamada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Filed May 12, 1982, Ser. No. 377,535
Claims priority, application Japan, May 15, 1981, 56-72911
Int. Cl.[3] **H03K** *19/088, 19/013, 17/04*
U.S. Cl. 307—456 **5 Claims**

1. A NAND logic gate circuit comprising first and second terminals for connection to a power supply, a first transistor having a first main electrode coupled to said first terminal, a second main electrode coupled to said second terminal, and a control electrode for receiving a first input signal and generating a first output signal at said first main electrode, a second transistor having a first main electrode coupled to said first terminal, a second main electrode coupled to said second terminal, and a control electrode for receiving a second input

signal and generating a second output signal at said first main electrode of said second transistor, an inverter transistor having a first main electrode, a second main electrode coupled to said second terminal, and a control electrode coupled to said first main electrode of said first transistor for receiving said first output signal, said inverter transistor providing a inverted first output signal at its first main electrode, logic gate means having an output terminal and receiving said second output



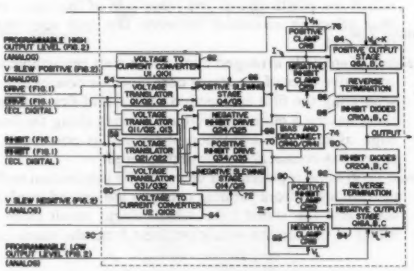
signal and said first inverted output signal for generating a logical AND output signal on said output terminal; a third transistor having a first main electrode coupled to said first main electrode of said first transistor, a second main electrode coupled to said second terminal, and a control electrode responsive to said second input signal having a low value to change said first output signal to a low value independent of the value of said first input signal.

4,507,576

METHOD AND APPARATUS FOR SYNTHESIZING A DRIVE SIGNAL FOR ACTIVE IC TESTING INCLUDING SLEW RATE ADJUSTMENT

David R. McCracken, Portland, and Robin R. Larson, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 28, 1982, Ser. No. 437,248
Int. Cl.³ H03K *5/12, 19/092*
U.S. Cl. 307—475 **14 Claims**



1. A pulse converter circuit for converting a first digital signal compatible with a first logic family having first predetermined high and low logic levels and positive and negative slew rates, to a second digital signal compatible with a second logic family having second predetermined high and low logic levels and positive and negative slew rates, said circuit comprising:

first means for receiving said first digital signal, and signals representative of the predetermined high and low logic levels and the positive and negative slew rates compatible with the second logic family;

first voltage translator means for continuously detecting the logic state and state transitions of said first digital signal;

slew rate adjustment means for establishing logic state transition rates in response to the predetermined positive and negative slew rate representative signals at the transition times detected by said voltage translator means;

first clamp means for establishing the high and low logic levels of the second digital signal in response to the signals representative of the predetermined high and low logic levels, and the transition rates established by the slew rate adjustment means; and

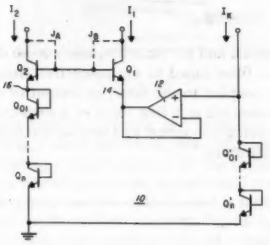
output means coupled to the first clamp means, for presenting a composite second digital signal.

4,507,577

NTH ORDER FUNCTION CONVERTER

Stephen C. Kwan, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 13, 1981, Ser. No. 234,130
Int. Cl.³ G06G *7/20*
U.S. Cl. 307—494 **9 Claims**



1. A programmable function converter comprising:

a first plurality of N series-connected diode means;

a second plurality of N series-connected diode means wherein the last diode means of said second plurality of diode means is coupled to the last diode means of said first plurality of diode means and to a common voltage point;

a buffer means having inverting and non-inverting inputs and an output wherein said non-inverting input is coupled to said second plurality of diode means and said inverting input is coupled to said output;

first means for coupling a first current source to said buffer means;

second means for coupling a second current source to said first plurality of diode means, said second means also being coupled to said first means;

a third current source coupled to said non-inverting input of said buffer means; and

third means for selectively coupling said first current source to said second coupling means or said second current source to said first coupling means, whereby said first current source is equal to the product of the (N+1)th power of said second current source and the (−N)th power of said third current source when said second current source is coupled to said first coupling means, and whereby said second current source is equal to the (N+1)th root of the product of said first current source and the Nth power of said third current source when said first current source is coupled to said second coupling means.

4,507,578

FREQUENCY DISCRIMINATING CIRCUIT

Kholchi Matsuda, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

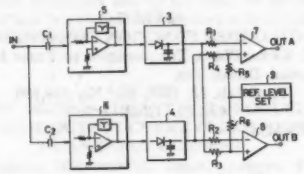
Filed Jun. 17, 1982, Ser. No. 389,354
Claims priority, application Japan, Jun. 18, 1981, 56-94447
Int. Cl.³ H03J *5/00*
U.S. Cl. 307—520 **3 Claims**

1. A frequency discriminating circuit for discriminating a plurality of signals of different frequency, comprising:

a plurality of comparators provided according to said plurality of signals, said comparators respectively providing outputs when the levels of said signals are higher than respective reference levels;

a common reference level setting circuit to establish an initial predetermined reference level input to said comparators;

an input signal to any one of said plurality of comparators being used to increase the reference levels of the other



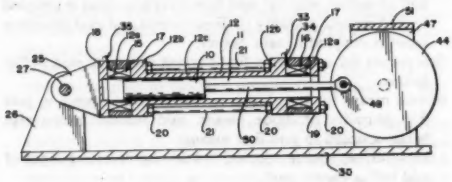
comparators; and for each frequency to be discriminated, an active filter tuned to the respective frequency, and a rectifier coupled to the filter, an output of each rectifier being connected to a first input of a respective comparator, and being connected to a second input of the remaining comparators.

4,507,579

RECIPROCATING PISTON ELECTRIC MOTOR

Jack C. Turner, 1985 S. 1200 East, No. 2, Salt Lake County, Utah 84105

Filed Sep. 29, 1983, Ser. No. 537,080
Int. Cl.³ H02K 7/06
U.S. Cl. 310—23 **8 Claims**



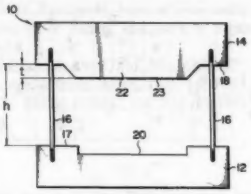
1. A reciprocating piston electrical motor comprising a base; a crankshaft mounted for rotation on the base; at least one cylinder and piston assembly pivotally mounted on the base, said cylinder and piston assembly comprising a nonmagnetic cylinder housing forming a piston chamber and having flange portions at each end of a central portion, a magnetic piston freely slidable within the piston chamber, separate coils of wire wrapped about each end of the piston chamber, each coil abutting a flange portion of the cylinder housing and extending outwardly therefrom so as to leave an intermediate portion of the piston chamber free of such coils, a sleeve associated with and abutting each flange portion of the housing extending outwardly from the flange and surrounding the respective coil, an end cap at each end of the piston chamber abutting its associated sleeve, a plurality of bolts extending the entire length of the piston chamber and through each of the flanges, sleeves, and end caps so as to not only secure the respective sleeves and end caps to a flange, but also to strengthen the entire cylinder and piston assembly, a piston rod extending from one end of the piston chamber, said piston rod being rigidly connected to the magnetic piston at one end and rotatably connected to the crankshaft at the other end; and means for supplying electrical power to the coils of the at least one cylinder and piston assembly in such manner as to cause the magnetic piston to reciprocate in the piston chamber.

4,507,580

INSULATION INSERT ASSEMBLY AND METHOD FOR MANUFACTURING THE SAME

Ken Obara, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 24, 1983, Ser. No. 497,681
Claims priority, application Japan, Jun. 18, 1982, 57-105112
Int. Cl.³ H02K 3/48
U.S. Cl. 310—214 **5 Claims**



1. An insulation insert assembly for effecting insulation between first and second coils of a stator core having the turns of the coils inserted into stator core slots, said inserts comprising:

a first substantially rectangular insulation sheet having one substantially linear lateral edge insertable between those parts of the first and second coils which are positioned on one side of the stator core, thus effecting insulation between the first and second coils;

a second substantially rectangular insulation sheet 12 disposed in the same plane as the first insulation sheet to directly oppose the same, said second insulation sheet having a lateral edge parallel to the lateral edge of the first insulation sheet and separated therefrom by a distance substantially equal to the thickness of the stator core, and a protrusion projecting from the lateral edge of the second insulation sheet toward the first insulation sheet and insertable between those parts of the first and second coils which are positioned on the other side of the stator core, thus effecting insulation between the first and second coils; and

a pair of spatially arranged connection rods registrable with respective ones of the stator core slots for connecting and separating the first and second sheets, said first insulation sheet having a depression which extends along the lateral edge of said first insulation sheet and is positioned between the connection rods and wherein

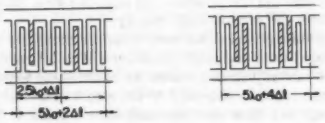
said protrusion is positioned between the connection rods to prevent a gap from forming between the second insulation sheet and the stator core which might result from the lifting of the second insulation sheet from the stator core.

4,507,581

ELECTRODE STRUCTURE FOR SAW DEVICE

Toyoji Tabuchi, and Mitsutaka Hikita, both of Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,521
Claims priority, application Japan, Sep. 29, 1982, 57-168353
Int. Cl.³ H03H 9/25
U.S. Cl. 310—313 B **17 Claims**



1. An electrode structure for a surface acoustic wave (SAW)

device which includes a plurality of electrode configurations deposited separately on a piezoelectric substrate, for converting an electric signal into a SAW signal, propagating the SAW signal in the piezoelectric substrate, and converting the SAW signal into another electric signal, comprising:

at least one of said electrode configurations including contiguous parallel stripes of alternating electrode and free areas, the electrode area being covered with a conductive material and the free area being not covered with the conductive material, and the parallel stripes being grouped into a plurality of arbitrary sections having a same number of stripes;

each of said arbitrary sections comprising a first part including a plurality of stripes of a first width and a second part including at least one stripe of a second width different from the first width, the number of the plurality of stripes of said first width being the same for each arbitrary section and the number of the at least one stripe of said second width being the same for each arbitrary section,

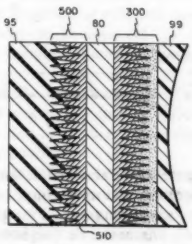
whereby the center frequency of the frequency characteristic of said at least one electrode configuration otherwise to be determined by said first part is modified by the effect of said second part so as to provide a finely adjustable center frequency for the SAW device.

4,507,582

MATCHING REGION FOR DAMPED PIEZOELECTRIC ULTRASONIC APPARATUS

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,897
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—327 **48 Claims**



1. In an apparatus wherein ultrasonic energy is communicated between an ultrasonic transducer and a transmission medium, the improvement comprising:

a matching region disposed between a surface of said transducer and said medium, said matching region including a layer having a multiplicity of tapered elements, each of said elements tapering down in size in the direction away from said transducer and toward said medium;

a damping material; and

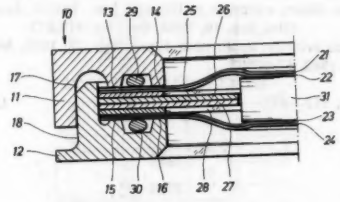
another matching region disposed between an opposing surface of said transducer and said damping material, said another matching region including another layer having a multiplicity of tapered elements, each of said elements of said another layer tapering down in size away from said transducer.

4,507,583

PIEZO-ELECTRIC LEVEL DETECTOR

Niels D. Jensen, and Hans O. Brunsgaard, both of Bjerringbro, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Feb. 2, 1984, Ser. No. 576,118
Claims priority, application Denmark, Feb. 3, 1983, 439/83
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—338 **14 Claims**



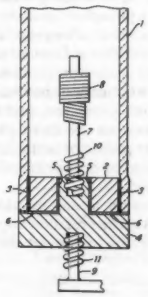
1. A level detector for starting and stopping an electric system comprising a piezo-electric crystal; two resilient sheet elements constituting contact surfaces for the crystal and situated one on each side of the crystal; wherein said resilient sheet elements are insulated on the outside; and a sensor housing surrounding said resilient sheet elements liquid-tightly along the edge but allowing a substantial portion of at least one of the outwardly insulated outsides of the sheet elements to be uncovered, said sensor housing consisting of a top part and a bottom part, each part being provided with a plurality of squeezing means, the two resilient sheet elements being situated between said squeezing means.

4,507,584

DISCHARGE LAMP WITH METAL COIL ELECTRODE SUPPORT INSERTED INTO CERMET END CAP

James R. Coaton, Groby, and Douglas Hussey, Coventry, both of England, assignors to Thorn EMI plc, London, England

Filed Sep. 13, 1982, Ser. No. 417,653
Claims priority, application United Kingdom, Sep. 15, 1981, 8127747
Int. Cl.³ H01J *61/36, 9/32*
U.S. Cl. 313—624 **12 Claims**



4. A discharge tube assembly for a high pressure discharge lamp, the assembly including:

a discharge arc tube made of ceramic material;

at least one end closure member made of an electrically conductive cermet, sealed in a gas-tight manner in a respective end of the arc tube and having an aperture extending part way only therein;

an electrode including an electrode shank in the form of a rod of refractory electrically conductive material;

and metal coil having a first end and a second end forming an

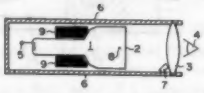
electrode support member wherein the metal coil is in part sintered at said first end into said aperture and said second end forms a socket into which said shank is inserted to be held and supported thereby.

4,507,585

BEAM-INDEXING COLOR PICTURE TUBE ARRANGEMENT

Fumio Inoue; Hiroshi Jitsukata, and Kunio Ando, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,672
Claims priority, application Japan, Sep. 18, 1981, 56-146225; Jun. 4, 1982, 57-94802
Int. Cl.³ H01J *29/89, 29/18*
U.S. Cl. 313—471 **12 Claims**



1. A beam-indexing color picture arrangement comprising:
an electron gun;
a screen glass;
a plurality of color phosphors provided on one surface of said screen glass facing said electron gun for respectively emitting predetermined color lights in the forward direction of said screen glass upon impingement of an electron beam thereon;
index phosphors provided on said one surface of said screen glass in a predetermined positional relation with said color phosphors in juxtaposition therewith for respectively generating light index signals in the forward direction of said screen glass upon impingement of electron beam thereon, said index phosphors including a first index phosphor which has a short afterglow time and exhibits its emission spectrum different from all said color phosphors and a second index phosphor which has a short afterglow time and exhibits its emission spectrum similar to a specified one of said color phosphors, said first index phosphor being provided between the color phosphors other than said specified color phosphor and said second index phosphor being provided in a form mixed with said specified color phosphor; and
photoelectric conversion means provided in front of said screen glass with a spaced relation therefrom for receiving said light index signals to convert them into electric signals.

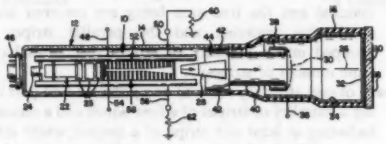
4,507,586

TRAVELING WAVE PUSH-PULL ELECTRON BEAM DEFLECTOR WITH PITCH COMPENSATION

Ronald E. Correll, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 27, 1982, Ser. No. 437,089
Int. Cl.³ H01J *23/16, 29/96*
U.S. Cl. 315—3 **12 Claims**

1. An electron beam deflection structure comprising
traveling wave type deflection means including first and second deflection members disposed on opposite sides of and extending along the path of an electron beam for deflecting the beam in response to electrical deflection signals applied to said members, each of the deflection members including a plurality of deflection plate segments connected in series by a plurality of lead portions to form an electrical signal transmission line, the plate segments in at least a portion of the deflection structure including the



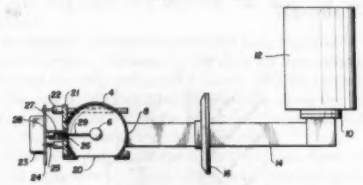
output end thereof being spaced at progressively increasing distances from said path, and
means for compensating for the transmission line impedance variation resulting from said increased spacing, including the provision of different pitches in said first and second deflection members resulting from different numbers of deflection plate segments in said members.

4,507,587

MICROWAVE GENERATED ELECTRODELESS LAMP FOR PRODUCING BRIGHT OUTPUT

Charles H. Wood, Bethesda, and Michael G. Ury, Rockville, both of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed May 24, 1982, Ser. No. 381,482
Int. Cl.³ H01J *7/46, 19/80*
U.S. Cl. 315—39 **14 Claims**

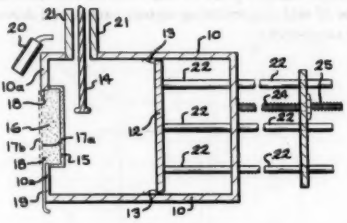


1. A microwave generated electrodeless lamp which radiates with substantial brightness and uniformity, comprising:
microwave energy generating means for generating microwave energy of a characteristic frequency,
a microwave chamber having a slot for admitting microwave engine of said characteristic frequency to the chamber,
waveguide means for coupling said microwave energy of said characteristic frequency from said microwave energy generating means to said microwave chamber,
an envelope in said microwave chamber which contains a plasma forming medium, said envelope having a maximum dimension which is substantially smaller than a wavelength of said microwave energy of characteristic frequency,
said chamber having an opening for allowing radiation which emitted by said envelope to exit, and,
said opening being covered by a mesh which is substantially transparent to ultraviolet radiation but substantially opaque to said microwave energy.

4,507,588
ION GENERATING APPARATUS AND METHOD FOR THE USE THEREOF

Jes Asmussen, Okemos, and Joseph J. Root, East Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Feb. 23, 1983, Ser. No. 468,897
Int. Cl.[3] H01J 7/46, 19/80
U.S. Cl. 315—39 18 Claims



1. In an ion generating apparatus including a plasma source employing a radio frequency wave coupler which is excited in one or more of its TE or TM modes of resonance to produce the plasma in the coupler and optionally including a static magnetic field which aids in confining the ions in the coupler including a probe inside the coupler which couples the radio frequency waves to the coupler and including ion attracting means for attracting the ions from said plasma preferably by means of a suitable voltage potential which accelerates the ions, the improvement which comprises:

(a) an electrically insulated plasma defining chamber (**15**) having a central longitudinal axis and mounted in closely spaced relationship to an area (**16**) of a metallic radio frequency wave coupler which is in the shape of a hollow cavity (**11**);

(b) at least one metallic ion attracting means (**17***a*) mounted adjacent to and electrically insulated from the insulated chamber which ion attracting means forms part of the radio frequency coupler;

(c) gas supply means (**18, 19**) for providing a gas which is ionized to form the plasma in the plasma defining chamber, wherein the radio frequency wave applied to the coupler creates and then maintains the plasma in the shape of an elongate, thin disk adjacent to the ion attracting means and perpendicular and surrounding to the axis in the chamber during steady state operation of the apparatus; and

(d) movable metal plate means (**12**) in the cavity mounted perpendicular to the axis and movable towards and away from the plasma disk; and

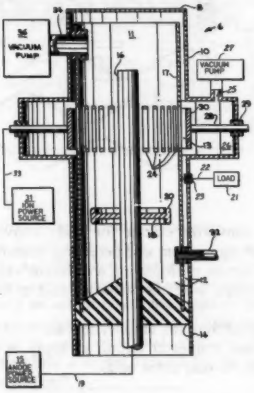
(e) a movable probe (**14**) connected to and extending inside the coupler for coupling the radio frequency waves to the coupler wherein movement of the plate means and the probe in the coupler achieves a selected TE or TM mode of resonance of the radio frequency wave in the coupler and varies the resonance of the mode.

14. The method of claim **13** wherein the ion attracting means is a plate (**30**) mounted adjacent the chamber and wherein the ions are attracted to the plate.

4,507,589
LOW PRESSURE SPARK GAP TRIGGERED BY AN ION DIODE

Daniel S. Prono, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1982, Ser. No. 413,639
Int. Cl.[3] H01J 7/24; H05B 31/26
U.S. Cl. 315—111.01 8 Claims



1. Spark gap apparatus comprising:

(a) housing means defining a chamber wherein said chamber is provided with a high pressure region and a low pressure region, such that said fluid enters said chamber in said high pressure region before exiting said chamber and said housing;

(b) anode means mounted inside said housing means in the high pressure region;

(c) ion plate means mounted inside said housing means in the low pressure region;

(d) pumping means for introducing into and withdrawing from said housing a fluid capable of being ionized;

(e) power source means for energizing said ion plate means, causing said ion plate means to emit positive ions to ionize said fluid so said fluid is capable of conducting electric current;

(f) means for connecting said anode means with electric current source means capable of providing electric current to said anode means; and

(g) cathode means mounted inside said housing means such that said cathode means separates said high and low pressure regions, and said cathode means being further provided with emission ports which permit the passage of said positive ions therethrough.

4,507,590
BRUSHLESS DC MOTOR

Kiyoshi Miyazaki, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Jul. 15, 1983, Ser. No. 514,133
Claims priority, application Japan, Jul. 15, 1982, 57-123213
Int. Cl.[3] H02P 6/02
U.S. Cl. 318—254 8 Claims

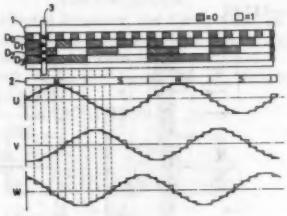
1. A brushless DC motor comprising:

n phase drive coils mounted fixedly on a stator yoke;

a magnetic rotor assembly positioned to be rotated by said drive coils;

a rotary encoder coupled to said magnetic rotor assembly to be rotated thereby, m tracks of digitally coded waveform data being recorded on said rotary encoder, said m tracks of waveform data collectively representing a plurality of

different values at a respective plurality of different positions around the periphery of said rotary encoder; a stationary m-channel detecting element for detecting waveform data produced by rotating said rotary encoder to produce an m-bit parallel signal having a plurality of relative positions of said encoder and said detecting element;



a code converter circuit for code converting said m-bit parallel signal from said detecting element to form n phase drive signals each having a different value determined in accordance with the value of said m-bit parallel signal; and

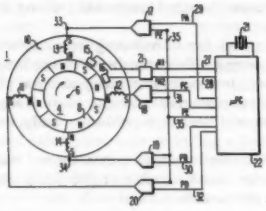
power amplifiers for amplifying said n phase drive signals from said converter circuit to apply in response thereto currents to said drive coils.

4,507,591

LINEAR PULSE WIDTH TO CURRENT CONVERTER FOR BRUSHLESS DC MOTORS

Kevin C. Kelleher, Plainfield, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,390
Int. Cl.[3] H02P *6/02*
U.S. Cl. 318—254 **4 Claims**



1. A system for controlling a brushless DC motor of a type having two or more stator coils which are successively energized to impart rotation to a rotor including a permanent magnet having a plurality of interleaved north and south poles comprising:

first and second sensor elements providing first and second bilevel signals corresponding to the relative position of said poles of said rotor magnet with respect to said stator coils;

a reference signal having a frequency to which the rotation rate of said rotor is to be synchronized;

control signal generating means responsive to said first and second bilevel signals for generating commutating signals the phases of which are determined by the state of said first and second bilevel signals and the durations of which are substantially determined by successive transitions of said bilevel signals, and being further responsive to said reference signal for synchronizing motor speed in a locked speed mode, said control signal generating means generating a speed control signal related to the difference between said rotation rate of said rotor and said reference signal frequency;

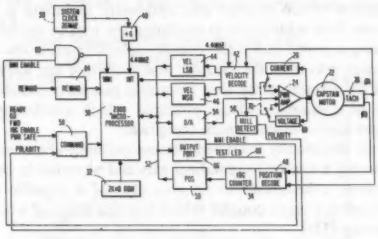
driving circuits, responsive to said commutating signals and said speed control signal, for energizing respective ones of said stator coils with drive currents, said driving circuits including an integrator for controlling the amplitude of the drive current during said locked speed mode such that simultaneous delivery of one of said commutating signals and said speed control signal to one of said integrators causes said respective drive current to ramp-up, removal of said speed control signal causes said respective drive current to hold the value to which said respective drive current reached prior to said removal and removal of said one of said commutating signals causes said drive current to ramp-down.

4,507,592

MICROPROCESSOR CONTROLLED TAPE CAPSTAN

Robert L. Anderson, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 459,720, Jan. 21, 1983, abandoned, which is a continuation of Ser. No. 321,070, Nov. 13, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 601,809
Int. Cl.[3] H02P *1/22*
U.S. Cl. 318—268 **8 Claims**



1. A magnetic tape drive comprising:

first and second reels for the supply and take-up of tape;

a read/write head;

a capstan for moving said tape with respect to said read/write head;

a motor driving said capstan;

means for outputting feedback signals indicative of the actual velocity of the motor; and

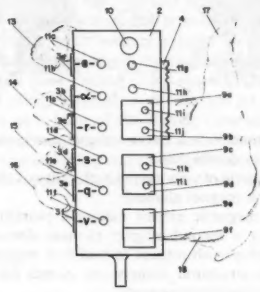
means for control of said motor, said means for control of said motor comprising:

a microprocessor adapted to receive GO and STOP commands for control of said motor in addition to said feedback signals indicative of the actual velocity of said motor, and to generate responsive signals for control of said motor based on said feedback signals and said commands, said microprocessor examining its previous history upon receipt of a given GO or STOP command so as to determine which of a plurality of possible predetermined control signal sequences, each causing differing maximum rates of change of motor velocity shall be generated in response to said given GO or STOP command, whereby excitation of mechanical resonances in said system can be avoided.

4,507,593
SYSTEM FOR CONTROLLING A SPATIALLY MOVABLE DEVICE

Klaus Göhrich, Küssaberg, and Heinz Vogt, Oberehrendingen, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Continuation of Ser. No. 354,356, Mar. 3, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,054
Claims priority, application Switzerland, Mar. 11, 1981, 1651/81
Int. Cl.³ H01H 9/02
U.S. Cl. 318—563 9 Claims



1. A system for controlling a plurality of position parameters of a spatially movable device comprising:

a plurality of actuators, each of said actuators corresponding to and acting upon one of said position parameters;

a hand-held manual unit provided with a plurality of control elements for selecting and controlling the change of said position parameters by means of the actuation of the corresponding ones of said plurality of actuators wherein said control elements include a plurality of trigger switches which are disposed on a first lateral face of said manual unit, whereby said trigger switches are positioned on said lateral face so that said trigger switches can be manipulated by the index, middle, ring and little finger of one hand of an operator while holding said manual unit and wherein said control elements further include a sliding means which is disposed on a second lateral face of said manual unit which second lateral face is opposite to said first lateral face and whereby said sliding means is disposed on said second lateral face in such a manner that said sliding means can be manipulated by the thumb of said one hand, and wherein said sliding means is disposed so as to be movable from a stable rest position in two opposite directions;

first means for activating a selected one of said actuators in correspondence to a selected one of said trigger switches with said means for activating being connected to said trigger switches and said actuators;

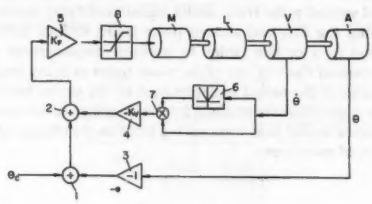
means for controlling the direction and speed of change of each of said actuators in correspondence to the direction and absolute value of deviation of said sliding means from said stable rest position, wherein said means for controlling is connected to said sliding means and said actuators; and

means for preventing any of said actuators from being activated as long as said sliding means is in said stable rest position, wherein said means for preventing is connected to said sliding means and said actuators.

4,507,594
DC SERVOMOTOR POSITION CONTROL

Akira Takemoto, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 16, 1983, Ser. No. 523,432
Claims priority, application Japan, Aug. 17, 1982, 57-143124
Int. Cl.³ G05B 13/00
U.S. Cl. 318—615 2 Claims



1. A position control arrangement comprising:

a DC servomotor for driving a load;

means for defining a desired load position;

means for detecting a rotor current of said servomotor;

means for detecting an actual positional angle of said load;

means for detecting a rotational velocity of said load;

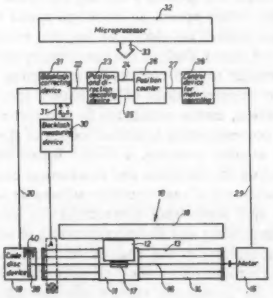
means, responsive to said rotational velocity detecting means, for generating a signal related to the square of rotational velocity; and

means, responsive to said desired load position, rotor current, actual positional angle, and square of rotational velocity signal for controlling rotor current so as to make the actual position equal to the desired position, said means including a limiter for limiting rotor current.

4,507,595
DEVICE FOR CORRECTING OF BACKLASH IN DRIVE MECHANISMS COMPRISING A SCREW AND A NUT

Kalman Rozsa, Järfälla, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

PCT No. PCT/SE82/00281, § 371 Date May 11, 1983, § 102(e) Date May 11, 1983, PCT Pub. No. WO83/01130, PCT Pub. Date Mar. 31, 1983
PCT Filed Sep. 13, 1982, Ser. No. 504,051
Claims priority, application Sweden, Sep. 18, 1981, 8105543
Int. Cl.³ G05B 11/01
U.S. Cl. 318—630 6 Claims



1. In a device for correcting a backlash arising on a change in the direction of movement of a nut means included in a drive mechanism and co-operating with a power driven screw, the nut means being connected to a unit which is movable back and forth along the screw and having an incremental pulse generating means (19) for generating in synchronism with the

movement of the screw first and second pulse trains having the same quadrangular shape but being 90° out of phase, the period of the pulse trains corresponding to the displacement of the movable unit a predetermined distance along the screw, and means for determining the pulse trains from the position and the direction of movement of the movable unit, the improvement comprising means for storing of a value of a value of the backlash with a resolution corresponding to a quarter of the first and second pulse trains and a signal modifying means for combining the first and second pulse trains in four different ways and in a certain order to perform displacement of a predetermined flank of one of the pulse trains as many steps of one quarter of the period as determined by the stored backlash value in a direction determined by the direction of movement of the movable unit that was existing prior to the change of the direction of movement.

4,507,596

POSITION ADJUSTING DRIVE UNIT

Wolfgang Angersbach, Darmstadt, and Karl-Heinz Meier, Zeilhard, both of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

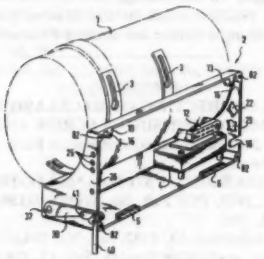
Continuation of Ser. No. 167,325, Jul. 10, 1980, Pat. No. 4,393,343. This application Nov. 22, 1982, Ser. No. 443,741

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930228

The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—640 **8 Claims**



1. A position adjusting drive unit for a rotary shaft of a sewing machine, comprising a driving electrical motor having an adjustable rotary speed, an electrical speed regulating circuit for said motor, an electrical angular position adjusting circuit for the rotary shaft of the machine, operator-adjustable means connected to said circuits for generating signals corresponding to desired values of the rotary speed and of the angular position, means connected to said circuit for generating signals corresponding to actual values of the rotary speed and of the angular position, a circuit board supporting and interconnecting the electrical and mechanical component parts of said circuits and of said operator-adjustable signal generating means and supporting connectors for connecting said means for generating signals corresponding to actual values of the rotary speed and of the angular position, one of said mechanical component parts being an activation mechanism for said means for generating signals corresponding to desired values of said rotary speed and of said angular position, and a supporting box mechanically attached to said motor and having means for disconnectably supporting said circuit board, said supporting box further including a complementary activation device having guiding means for guiding and coupling said activation mechanism when said circuit board is attached to said supporting box.

4,507,597

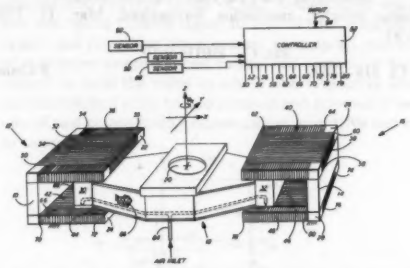
ELECTRO-MAGNETIC ALIGNMENT ASSEMBLIES

David Trost, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 10, 1983, Ser. No. 502,995

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—653 **11 Claims**



1. A commutatorless electro-magnetic alignment apparatus comprising, in combination:

a first magnetic circuit having a plurality of elements including a first magnet element;

a second magnetic circuit having a plurality of elements including a second magnet element disposed in spaced relationship with respect to said first magnetic circuit;

a movable structural component, means for mounting an object on said component;

one element of each magnetic circuit being fixedly attached to said movable structural component;

said movable structural component being a single structure which is rigid in its plane of motion;

a first current carrying coil assembly mounted in said first magnetic circuit;

a second current carrying coil assembly mounted in said second magnetic circuit, said first and said second coil assemblies being mounted at an angle with respect to each other;

a third current carrying coil assembly mounted in said second magnetic circuit;

a fourth current carrying coil assembly mounted in said second magnetic circuit, said third and fourth coil assemblies being mounted at an angle with respect to each other; and

controller means for controlling the flow and direction of current through said coil assemblies, respectively.

4,507,598

TWO-AXIS POSITIONING SYSTEM

Noriaki Wakabayashi, Hirakata; Kiichiro Yamada, Ibaraki, and Hiromi Onodera, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 20, 1983, Ser. No. 486,971

Claims priority, application Japan, Apr. 21, 1982, 57-67853

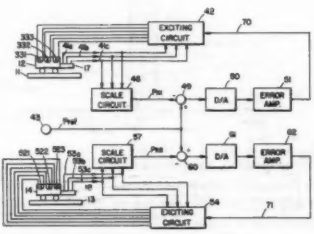
Int. Cl.³ G05B *11/00*

U.S. Cl. 318—687 **3 Claims**

1. A two-axis positioning system comprising: a first linear servomotor provided with a first guiding stator fixedly disposed in the direction of a first axis and a first movable element guided by said first guiding stator to be movable in the direction of the first axis; a second linear servomotor provided with a second guiding stator fixedly disposed in parallel to said first guiding stator and spaced therefrom at the predetermined interval and a second movable element guided by said second guiding stator to be movable in the direction of the first axis; a third linear servomotor provided with a third guiding stator which extends in the direction of a second axis intersecting said first axis and is supported to said first and second movable elements and a third movable element guided by said third guiding stator to be movable in the direction of the second axis;

a two-axis position control object mounted to said third movable element at said third linear servomotor; first and second closed-loop servo circuits materializing position control for said movable elements at said first and second linear servomotors following an input position command signal which assigns the position of said two-axis position control object in the direction of the first axis, and a third closed-loop servo circuit materializing the position control for said movable element at said third linear servomotor following the input position command signal which assigns the position of said two-axis position control object in the direction of the second axis;

wherein said first, second and third linear servomotors are provided with first, second and third position detecting sensor means which output position signals corresponding to the position of said first movable element with respect to said first guiding stator, the position of said second movable element with respect to said second guiding stator, and the position of said third movable element with respect to said third guiding stator respectively, and first, second and third electronic scale circuits for measuring the position on a basis of the signals from said position detecting sensor means respectively, said first and second guiding stators including magnetic materials each extending in the direction of the first axis, said third guiding



stator including magnetic material extending in the direction of the second axis, said magnetic materials each comprising a plurality of magnetic teeth of spline-like shape and in the fixed pitch, said first, second and third movable elements each including a plurality of coils and magnetic materials formed in a plurality of groups of magnetic teeth of spline-like shape, each of said groups of magnetic teeth being disposed opposite to said first, second and third guiding stators at fixed intervals respectively, said first, second and third position detecting sensor means including a plurality of sensor elements which detect the crests and roots of said spline-like shaped magnetic teeth at said first, second and third guiding stators and output a plurality of position signals periodical and like sinewave and different in phase with regard to the position, said first, second and third electronic scale circuits comprising; first, second and third interpolation circuits which detect by fine resolution the positions of said first, second and third movable elements on the basis of position signals output from said sensor elements at said first, second and third movable elements respectively; first, second and third directional discriminator circuits which discriminate the direction of each of said movable elements; and first, second and third counters which reversibly count said directionally discriminated pulses.

4,507,599

METHOD AND DEVICE FOR CONTROLLING A STEPPING MOTOR

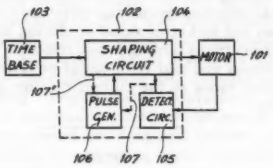
Yves Guerin, Granges, Switzerland, assignor to ETA S.A., Fabriques d'Ebauches, Granges, Switzerland

Filed Sep. 29, 1983, Ser. No. 537,088

Claims priority, application Switzerland, Oct. 13, 1982, 5974/82

Int. Cl.³ H02K 29/04

U.S. Cl. 318—696 **8 Claims**



1. Method for controlling a stepping motor having a coil, a rotor magnetically coupled to said coil and means for bringing said rotor into, or maintaining it in, at least one rest position in the absence of any other influence, comprising the steps of:

applying a driving pulse to said coil each time the rotor is to turn by one step;

producing a detection signal if said rotor has not correctly completed its step in response to said driving pulse;

applying a release pulse to said coil in response to said detection signal for causing said rotor to be released if it has been blocked during said step; and then

applying a correction pulse to said coil in response to said detection signal.

4,507,600

TWO-TERMINAL CURRENT REGULATOR

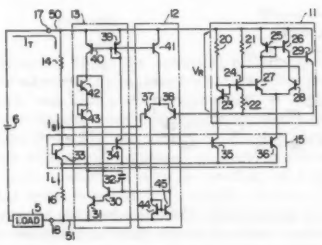
Tsutomu Okayama, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,250

Claims priority, application Japan, Apr. 2, 1982, 57-55818

Int. Cl.³ G05F 1/56

U.S. Cl. 323—281 **14 Claims**



1. A two-terminal current regulator comprising:

first and second terminals, one being adapted to be connected to one terminal of a load having the other end thereof connected to one polarity output terminal of non-regulated D.C. power supply, and the other being adapted to be connected to the other polarity output terminal of said D.C. power supply;

detection means arranged to be powered by said D.C. power supply through said first and second terminals for producing a voltage representative of a current flowing in accordance with an output voltage of said D.C. power supply;

reference voltage generating means arranged to be powered by said D.C. power supply through said first and second

terminals for generating a reference voltage of a predetermined constant level independently of the output voltage of said D.C. power supply;

error signal producing means arranged to be powered by said D.C. power supply through said first and second terminals for comparing said voltage produced by said detection means with said reference voltage to produce an error signal representative of a difference therebetween;

means responsive to said error signal for controlling the current flowing in said detection means such that said voltage produced by said detection means is maintained at a constant level; and current distribution means connected to said detection means, said reference voltage generating means and said error signal producing means for rendering the currents flowing in said reference voltage generating means and said error signal producing means to be constant ratios to the current flowing in said detection means.

4,507,601

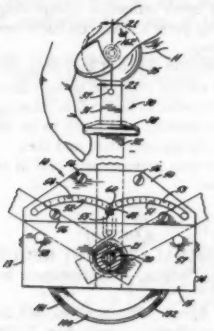
LEVER STROKE CONTROL

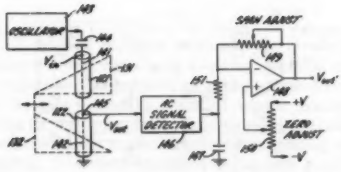
Herman J. Andresen, 726 Carriage Hill, Glenview, Ill. 60025

Filed Feb. 25, 1983, Ser. No. 469,584

Int. Cl.³ G05G *9/04*

U.S. Cl. 323—347 **21 Claims**





3. In a manual controller for producing an output signal in accordance with movement from a reference position, the combination comprising a frame, a quadrant lever formed of first and second elements telescoped together, one of the elements having a shaft providing a rockable connection with the frame for swinging movement with respect to the reference position while the other element is carried thereby, the first element having a palm rest at its outer end, the second element having a cooperating finger grip, means including a spring for relatively biasing the elements endwise so that the palm rest and finger grip are spread apart, a stop effectively between such elements for limiting the degree of spread to an amount which enables the fingers of the operator to engage the finger grip while the palm of the hand rests upon the palm rest, a stationary cam member on the frame presenting a cam track arranged closely parallel to the plane of swinging movement of the lever, the lever having a cam follower secured to the said other element and extending perpendicular to the plane of swinging movement of the lever into engagement with the cam track, the cam track being so contoured that in at least a portion of the arc of movement of the lever from its reference position the cam follower thereon is yieldingly obstructed by the cam track so that progressive free movement of the lever must be accompanied by progressive squeezing movement of the hand of the operator with the result that the squeezing movement controls the progress of rocking movement, a drum coupled to the shaft, a tube of magnetically saturable material mounted on the frame and spaced from and parallel to the drum axis, and an extensive permanent magnet mounted on the surface of the drum and having a helically arranged edge so that as the lever is rocked there is a progressive change in the portion of the tube which is magnetically saturated by the magnet, and means including a winding penetrating the tube for generating an output signal in accordance with the degree of saturation of the tube.

4,507,602

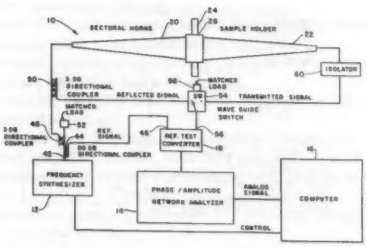
MEASUREMENT OF PERMITTIVITY AND PERMEABILITY OF MICROWAVE MATERIALS

Donald G. Aguirre, Kirtland AFB, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 13, 1982, Ser. No. 407,985

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58 R **6 Claims**



3. Apparatus for measuring the complex permittivity and permeability of different materials at millimeter wavelengths with frequencies extending into a region above 16 gigahertz, comprising first and second horns, each horn being a horizontal sectoral horn having a throat at one end and having one pair of sides diverging to a mouth at a wider end, the other pair of sides being parallel, the two horns being placed mouth-to-mouth with means for placing a sample of material between them, means for supplying a continuous wave signal at a set frequency to the first horn, so that the signal propagates in the first horn to the sample; part of the signal energy being reflected from the sample and returned to the throat of the first horn, and part being transmitted through the sample and the second horn to its throat, and means for alternatively supplying the reflected signal from the throat of the first horn and the transmitted signal from the throat of the second horn to equipment for analysis to determine the complex permittivity and permeability;

wherein said means for placing a sample comprises a housing between the mouths of the two horns, the housing having an opening transverse to the horns, a slider section which fits into the opening, the slider section having first, second and third windows, the first window having a shorting plate to obtain a reference for making reflection coefficient measurements, the second window being open to obtain a reference for making transmission coefficient measurements, the third window being used to hold the sample;

a sample holder for holding the sample, the sample holder

being adapted for insertion into the third window, and a gauge block for use in properly locating the sample in the sample holder.

4,507,603

APPARATUS FOR THE MEASUREMENT OF THE MOVEMENT OF A MEMBER HORIZONTALLY RELATIVE TO A DATUM

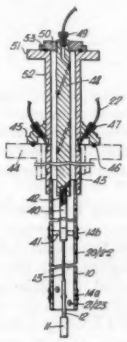
Peter F. Roach, Warrington; Christopher J. Caldwell-Nichols, Abingdon, and Alexander Thomson, Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jun. 11, 1982, Ser. No. 387,560

Claims priority, application United Kingdom, Jun. 17, 1981, 8118635

Int. Cl.³ G01R *27/26*

U.S. Cl. 324—61 P **5 Claims**



1. Apparatus for the measurement of the movement of a member horizontally relative to a datum characterised in that said apparatus includes means (**12, 30**) for capacitively resolving said horizontal movement from a measurement of the inclination of a plumb (**11**), said means for resolving horizontal movement comprises two pairs of orthogonally disposed electrodes (**3**) capacitively related to said plumb, and said electrodes (**30**) are provided by the conductor elements of mineral insulated cables (**22**) from which the outer sheath has been stripped over a limited length to expose bare conductors (**23**).

4,507,604

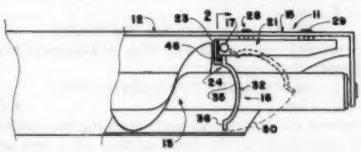
FLOWABLE MATERIAL MEASURING APPARATUS

Roger L. Sherer, Box 2453, Great Falls, Mont. 59403

Filed Feb. 16, 1983, Ser. No. 467,038

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.1 **11 Claims**



1. Apparatus for measuring the quantity of flowable particulate material passing through a conduit; said apparatus including a mounting portion, a flowable material contacting portion, a sensing portion, a circuitry portion and a quantity determining portion; said mounting portion including a support bracket, a transversely disposed bulkhead section affixed to said bracket adjacent the entry end of said apparatus, mounting means disposed along the length of said bracket, fastener means capable of securing said bracket to said conduit; said flowable material contacing portion including baffle means extending from said bracket adjacent the entry end of said apparatus, said baffle means having one end pivotally connected to said bracket, said baffle means being pivotably away from the entry end of said apparatus; said sensing portion including mechanically actuatable voltage varying means, said voltage varying means being mounted on said bracket adjacent said pivotal connection of said baffle means with said bracket, said voltage varying means being operatively connected to said baffle means; said circuitry portion including converter means connected electrically to said voltage varying means, said converter means converting voltage values into periodic electrical pulses, pulse adapter means connected electrically to said converter means, said adapter means interfacing said periodic pulses from said converter means; said quantity determining portion including programmable information processing means connected electrically to said adapter means, said information processing means receiving said periodic pulses from said adapter means, programming means connected to said information processing means for entering information therein, and display means responsive to said information processing means.

4,507,605

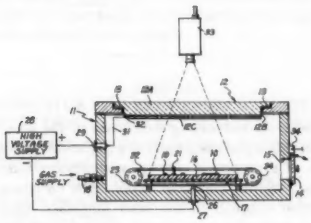
METHOD AND APPARATUS FOR ELECTRICAL AND OPTICAL INSPECTION AND TESTING OF UNPOPULATED PRINTED CIRCUIT BOARDS AND OTHER LIKE ITEMS

Donald J. Geisel, Clifton Park, N.Y., assignor to Testamatic, Incorporated, Latham, N.Y.

Filed May 17, 1982, Ser. No. 379,005

Int. Cl.³ G01R *31/12*

U.S. Cl. 324—73 PC **33 Claims**



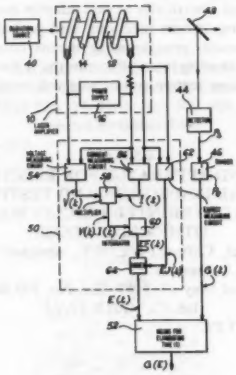
1. An apparatus using the electrical and photo-emissive properties of a gaseous atmosphere for the electrical and physical inspection and testing by optical means of ites such as printed circuit boards, ceramic substrates, and other like items which contain or include electrically conductive parts, paths, and surfaces whose electrical and physical continuity and conformance to a standard is to be verified, said apparatus comprising a sealable substantially airtight chamber for containing a gaeous atmosphere while allowing access to the interior thereof for the placement of items under test, means for introducing a gaseous atmosphere capable of cathode luminescence at a low pressure into the sealable chamber with an item to be tested in place within the chamber, a movable probe disposed within the sealable chamber for coupling one terminal of a source of excitation electric potential to desired test points located within an x-y plane on the surface of an item under test, said sealable chamber having a transparent partition disposed over the location of an item under test for allowing viewing of the surface of an item being tested, and means for coupling a remaining terminal of said source of excitation electric potential to a conductive surface in said sealable chamber substantially opposite the surface of an item under test whereby cathode luminescence is produced within the sealable chamber around test points excited by said movable probe and around all points having electrical continuity therewith.

4,507,606

DEVICE FOR MEASURING THE VARIATIONS IN THE GAIN OF A LASER AMPLIFIER AS A FUNCTION OF THE PUMPING ENERGY AND A PROCESS UTILIZING THIS DEVICE

Marcel Bédu, Clamart, and Thierry Rousseau, Neuilly sur Marne, both of France, assignors to Commissariat a l'Energie Atomigue, Paris, France

Filed Apr. 5, 1982, Ser. No. 365,158
Claims priority, application France, Apr. 6, 1981, 81 06857
Int. Cl.³ G01R 29/00; G01J 1/42
U.S. Cl. 324—158 R 3 Claims



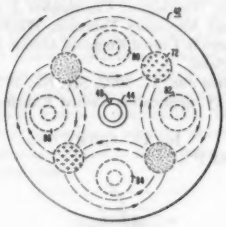
1. A device for measuring variations of the gain of a laser amplifier during a pumping time, at a particular wavelength, as a function of a pumping energy, said device comprising an optical source generating continuous light radiation and having an output coupled to the laser amplifier, said radiation having said particular wavelength and a power Pe, measurement means responsive to said optical source for measuring said power Pe, said radiation traversing the amplifier with a given radius, a tapping means for sampling part of the amplified radiation positioned at the output of the amplifier, a photoreceiver receiving said sampled part and measuring a power Ps corresponding to said part over the pumping time, quotient means responsive to said measurement means and said photoreceiver for forming the quotient of Ps divided and generating a signal G(t) representing variations of gain as a function of time, a voltage measuring circuit connected to a power supply of the laser amplifier for measuring the supply voltage V(t), a current measuring circuit connected to the power supply of the laser amplifier for measuring the supply current I(t), a multiplier circuit connected to said voltage measuring and current measuring circuits for generating a signal P(t) that is substantially equal to the product V(t) times I(t), an intergrater circuit connected to the output of said multiplier for generating a signal EF(t), an energy measuring circuit connected the power supply of the laser amplifier for generating the signal EJ(t), an adder circuit connected to said energy measuring circuit and to said intergrater circuit for generating a signal E(t), extraction means for eliminating the time dependence between the signal G(t) and E(t), and for generating a signal G(E) representing the gain variations as a function of the pumping energy for the given radius from the two signals G(t) and E(t).

4,507,607

ANGULAR ACCELEROMETER

William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 10, 1982, Ser. No. 387,301
Int. Cl.³ G01D 3/48, 3/54
U.S. Cl. 324—164 8 Claims



1. An angular accelerometer, comprising:
a stationary housing formed of magnetic material,
an electroconductive armature in said housing, journaled for rotation about a rotational axis, said armature being symmetrical about a bisecting plane disposed perpendicular to said rotational axis,
flux means in said housing for generating magnetic flux which links said armature in a pattern symmetrical about said rotational axis, said flux means including a plurality of pairs of permanent magnets, with the permanent magnets of each pair being spaced to provide an air gap between them in which the electroconductive armature is located,
pick-up coil means in said housing symmetrically arranged about said rotational axis, on both sides of said bisecting plane,
means accessible outside said housing for rotating said armature,
and terminal means accessible outside said housing connected to said pick-up coil means,
with said pick-up coil means providing a voltage when said armature is rotated having a magnitude proportional to the instantaneous acceleration rate of said armature.

4,507,608

METHOD AND ARRANGEMENT USING A PAIR OF RESONANT CIRCUITS FOR DETERMINING AND INDICATING THE POSITION OF AN UNEVENESS IN THE INNER SURFACE OF PIPES OR OTHER TYPES OF CYLINDRICAL STRUCTURES

Jürgen Flach, deceased, late of Duesseldorf, Fed. Rep. of Germany (by Marlis Flach, executor); Rigobert Opitz, Hamburg, Fed. Rep. of Germany; Heinz Daugart, Nienhof, Fed. Rep. of Germany, and Hans-Günter Baden, Munster, Fed. Rep. of Germany, assignors to Rheinmetall GmbH., Duesseldorf, Fed. Rep. of Germany

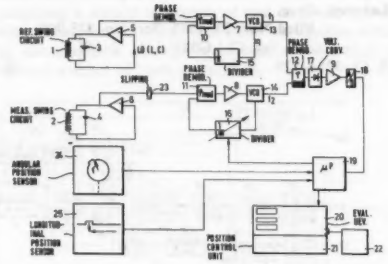
Filed Mar. 10, 1982, Ser. No. 356,794
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109445
Int. Cl.³ G01N 27/82; G01R 27/26
U.S. Cl. 324—220 8 Claims

1. A method for determining and indicating the position and depth of unevenness in the inner surface of a pipe using a scanning head arranged to longitudinally traverse the pipe and which is rotatable about the pipe axis, the method comprising the steps:
providing said scanning head, on its outer periphery, with a first coil in a measuring resonant circuit having a resonant frequency;
providing said scanning head, on its outer periphery and in the immediate axial vicinity of said first coil, with a plurality of second coils, equidistant from each other, each of

said second coils being at equal constant distance from the inner periphery of said pipe and being connected in series to form a reference resonant circuit having a resonant frequency;

increasing each of said resonant frequencies to an approximately equal multiple value of a higher frequency;

exactly matching the increased frequency of the measurement resonant circuit to the same value as the increased frequency of the reference resonant circuit;



moving said scanning head longitudinally and rotatably within said pipe whereby the entire inner surface thereof is scanned;

monitoring the longitudinal and angular position of said scanning head as said scanning head is traversed in said pipe;

comparing the values of said higher frequencies and measuring the difference therebetween while said scanning head is traversed in said pipe; and

converting said differences into values of the depths of unevenness in the inner surface of said pipe.

4,507,609

APPARATUS FOR NONDESTRUCTIVELY MEASURING THE THICKNESS OF A MAGNETIC FLUX CONDUCTIVE CLAD MATERIAL OVER A MAGNETIC FLUX CONDUCTIVE BASE MATERIAL OF A DIFFERENT PERMEABILITY

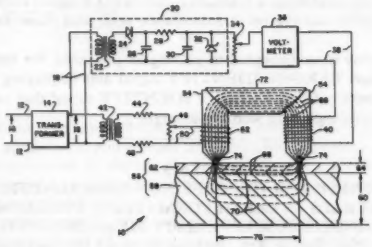
George R. Madewell, Soddy, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US81/01388, § 371 Date Nov. 16, 1981, § 102(e) Date Nov. 16, 1981, PCT Pub. No. WO83/01505, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 14, 1981, Ser. No. 322,304

Int. Cl.³ G01B 7/10; G01R 33/12

U.S. Cl. 324—230 3 Claims



1. An apparatus for determining the thickness of a magnetic flux conductive clad material over a magnetic flux conductive base material of a different permeability comprising:

a constant voltage alternating current power source;

a first voltage divider having a first terminal, a second terminal and a divided voltage terminal, said first terminal and said second terminal of said first voltage divider connected to said constant voltage alternating current power source;

an incomplete transformer core having a primary winding surrounding a portion thereof, a secondary winding surrounding a portion thereof, and first and second spaced legs having corresponding tapered first and second ends forming line segments at the apex of the taper, the length of the line segments being substantially the depth of the incomplete transformer core, the line segments perpendicular to the plane of the incomplete transformer core for contacting the material being clad-thickness measured, thereby completing a magnetic flux circuit through the incomplete transformer core and the material being clad-thickness measured and providing two line segment contacts a predetermined distance apart for establishing in the material being clad-thickness measured a magnetic field over a specific length and width;

means for connecting said divided voltage terminal and said second terminal of said first voltage divider to said primary winding of said incomplete transformer core;

means for supplying a constant direct current voltage;

a second voltage divider having a first terminal, a second terminal and a divided voltage terminal, said first terminal and said second terminal of said second voltage divider connected to said constant direct current voltage means;

means for measuring voltage;

means for connecting said divided voltage terminal and said second terminal of said second voltage divider to said voltage measuring means to provide power thereto; and

means for connecting said secondary winding to said voltage measuring means, whereby said voltage measuring means measures the voltage induced in said secondary winding when a voltage is applied to said primary winding and a magnetic flux conductive clad material over a magnetic flux conductive base material of different permeability is placed in contact with the first and second ends completing the magnetic flux circuit.

4,507,610

APPARATUS FOR ELECTROMAGNETICALLY DETECTING FLAWS IN METALLIC OBJECTS

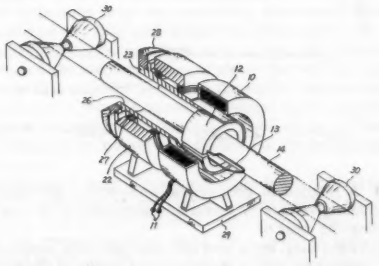
Eiichi Nakaoka, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Jul. 19, 1982, Ser. No. 399,301

Claims priority, application Japan, Jul. 30, 1981, 56-120553; Jul. 30, 1981, 56-120554

Int. Cl.³ G01N 27/82; G01R 33/12

U.S. Cl. 324—238 7 Claims



1. In an apparatus for electromagnetically detecting flaws in metallic objects of the type employing an electromagnetic coupling coil and an electrically conductive sensor including a sensor ring disposed inside said coupling coil, said coupling coil being connected to an external source of a high frequency current through a bridge circuit such that a first high fre-

quency current excites said coupling coil to produce a first high frequency magnetic field, said first high frequency magnetic field inducing a second high frequency current to flow in said sensor ring, said second high frequency current flowing in said sensor ring producing a second high frequency magnetic field which inturn induces a third high frequency current to flow in said object under test, where during relative movement between said sensor ring and said object under test, a flaw in said object under test will cause a change in the distribution and amount of said third high frequency current induced in said object under test as to cause a change in the amplitude and phase of said second high frequency current flowing in said sensor ring resulting in a corresponding change in the impedance of said coupling coil as seen by said external source of high frequency current through said bridge circuit and producing a corresponding change in the amplitude and phase of said first high frequency current flowing in said coupling coil, whereby a signal corresponding to said change in the amplitude and phase of said first high frequency current flowing in said coupling coil is produced in said bridge circuit, the improvement comprising:

a portion of said sensor formed as a sensor head extending outwardly from said sensor ring and positioned adjacently the surface of said object under test such that said third high frequency current is induced to flow locally in an area of said object under test immediately adjacent said sensing head such that a variation in said third high frequency current caused by a flaw in said object under test located in said area immediately adjacent said sensing head is electromagnetically coupled to said sensing head to cause a chane in the amplitude and phase of said second high frequency current flowing in said sensor ring.

4,507,611

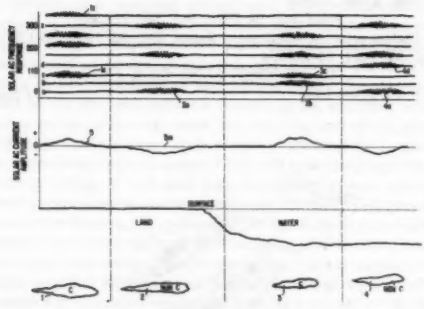
METHOD FOR DETECTING SURFACE AND SUBSURFACE ANOMALIES OF THE EARTH USING VERTICAL CURRENT MEASUREMENTS

Ronald L. Helms, 2936 Chain Bridge Rd., P.O. Box 384, Oakton, Va. 22124

Continuation of Ser. No. 876,163, Feb. 8, 1978, abandoned. This application Aug. 2, 1982, Ser. No. 404,459

Int. Cl.³ G01V *3/08, 3/06, 3/15*

U.S. Cl. 324—323 **12 Claims**



1. A method of geophysical prospecting for locating and evaluating surface or subsurface anomalies of the earth comprising the steps of:

(a) traversing, by at least one pass, generally horizontal with earth's surface, a predetermined region of the earth to be prospected;

(b) measuring, during step (a), local variations which occur in an alternating component of a vertical current having a frequency characteristic which emanates from the earth's surface in said predetermined region;

(c) recording the measurements; and

(d) correlating said measurements as a function of a spatial relationship between the variations measured in step (b) and points in said predetermined region being prospected to provide an indication of said surface and subterranean anomalies.

4,507,612

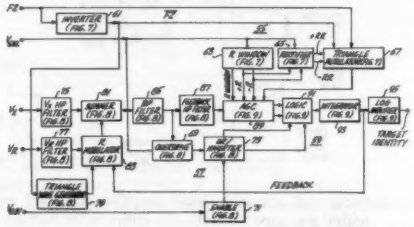
METAL DETECTOR SYSTEMS FOR IDENTIFYING TARGETS IN MINERALIZED GROUND

George C. Payne, Salem, Oreg., assignor to Teknetics, Inc., Lebanon, Oreg.

Filed Nov. 25, 1981, Ser. No. 325,040

Int. Cl.³ G01V *3/11, 3/165*

U.S. Cl. 324—329 **76 Claims**



1. A metal detector system for identifying metal targets located in mineralized ground comprising:

(A) a signal production subsystem including:

(1) detector means, including coil means and oscillator means for driving said coil means, for producing a detector signal that includes a target component when relative movement occurs between said coil means and a suitably close metal target, said detector signal also including a ground mineralization component when said metal target is buried in mineralized ground; and,

(2) electronic means coupled to said detector means for receiving said detector signal and producing at least one target signal, said target signal including a target component containing information about the phase angle of said metal target and a ground mineralization component when said metal target is buried in mineralized ground;

(B) a signal processor including a target identifying subsystem coupled to said electronic means for: (a) receiving said target signal; (b) removing substantially all of said ground mineralization component from said target signal; (c) determining the phase angle of said metal target only during the period of time said target component is present in said target signal; and, (d) producing a TARGET IDENTITY signal having a parameter that varies in accordance with said phase angle; and,

(C) display means coupled to said signal processor for receiving said TARGET IDENTITY signal and displaying said parameter of said TARGET IDENTITY signal that varies in accordance with said phase angle.

4,507,613

METHOD FOR IDENTIFYING NON-MAGNETIC MINERALS IN EARTH FORMATIONS UTILIZING MAGNETIC SUSCEPTIBILITY MEASUREMENTS

Eric P. Dion, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,443

Int. Cl.³ G01V *3/36, 3/28;* **G01N** *27/72;* **G01R** *33/16*

U.S. Cl. 324—340 **2 Claims**

1. A method for determining the presence of a select nonmagnetic mineral associated with a magnetic mineral in subsurface formations, comprising the steps of:

(a) obtaining core samples from a plurality of subsurface

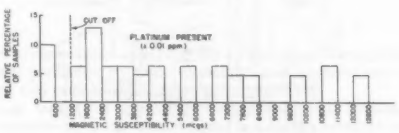
formations known to contain a select non-magnetic mineral in the presence of a magnetic mineral,

(b) measuring the non-magnetic mineral concentration of each of said core samples,

(c) measuring the magnetic susceptibilities of the magnetic mineral content of said core samples,

(d) preparing a first histogram of said magnetic susceptibility measurements of those of said core samples exhibiting non-magnetic mineral concentrations in excess of a selected number of parts per million,

(e) preparing a second histogram of said magnetic susceptibility measurements of those of said core samples exhibiting non-magnetic mineral concentrations less than said selected number of parts per million,



(f) selecting a cut-off level for said magnetic susceptibility measurements wherein at least a first percentage of said magnetic susceptibility measurements fall below said cut-off level along said first histogram and at least a second percentage of said magnetic susceptibility measurements fall above said cut-off level along said second histogram,

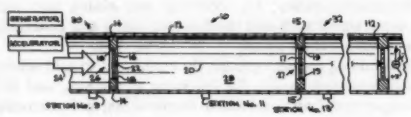
(g) running a magnetic susceptibility log in a borehole extending through an earth formation in which the select non-magnetic mineral content is to be identified, and

(h) identifying from said log those subsurface intervals along said borehole exhibiting magnetic susceptibility in excess of said selected cut-off level as subsurface formations containing said select non-magnetic mineral in concentrations in excess of said selected number of parts per million.

4,507,614
ELECTROSTATIC WIRE FOR STABILIZING A CHARGED PARTICLE BEAM

Daniel S. Prono; George J. Caporaso, and Richard J. Briggs, all of Livermore, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 477,458
Int. Cl.³ H05H *1/03*
U.S. Cl. 328—233 **13 Claims**



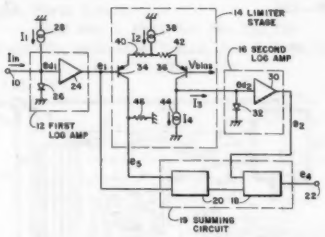
1. In a system including a charged particle beam generator, an accelerator, and a beam transport pipe, apparatus for stabilizing a beam of electrically charged particles which are propelled and guided to travel in a selected direction, said apparatus comprised of:

guiding means, disposed within said beam transport pipe, comprised of a material upon which an electric charge is induced by said electrically charged particle beam, said induced electric charge having a sign which is opposite to the sign of the electric charge of said particle beam, said electrically charged guiding means causing said particles of said particle beam to be electrically attracted to said guiding means, thus causing said particles to move toward and cluster around said guiding means to stabilize said particle beam as it travels.

4,507,615
NON-LINEAR AMPLIFIER SYSTEMS

Glenn Bateman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 16, 1982, Ser. No. 450,303
Int. Cl.³ G06G *7/12, 7/20*
U.S. Cl. 328—142 **2 Claims**



1. A non-linear amplifier system comprising:

a first amplifier stage having an input terminal to which an input current signal may be applied and having an output terminal at which an output voltage signal is developed in response to the input current signal, said first amplifier stage being operative to amplify low input signal levels linearly and higher input signal levels non-linearly;

a limiter and correction stage having an input terminal connected to the output terminal of the first amplifier stage and also having a first output terminal at which an output voltage signal is developed in response to the output voltage signal of the first amplifier stage, and a second output terminal at which an output current signal is provided in response to the output voltage signal of the first amplifier stage, said limiter and correction stage being operative to amplify linearly input signal levels corresponding to low input signal levels of the first amplifier stage and to establish maximum permitted values for its output voltage and current signals;

a second amplifier stage having an input terminal connected to the second output terminal of the limiter and correction stage and an output terminal at which an output voltage signal is developed in response to the input current signal received at its input terminal, said second amplifier stage being operative to amplify non-linearly input signals corresponding to low input signal levels of the first amplifier stage; and

a combining stage connected to the output terminal of the first amplifier stage, the output terminal of the second amplifier stage and the first output terminal of the limiter and correction stage for combining the output voltage signals of the first and second amplifier stages and the limiter and correction stage, so as to form the difference between the absolute values of the output voltage signals of the first amplifier stage and the limiter and correction stage and to provide an output voltage signal representative of the sum of the absolute values of the difference voltage and the output voltage signal of the second amplifier stage;

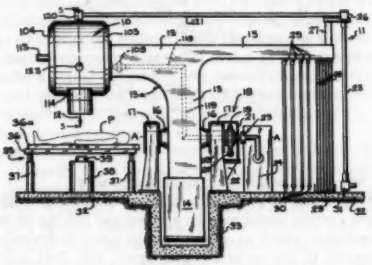
whereby, for a range of low input signal levels applied to the first amplifier stage, and output voltage signal of the combining stage is representative of the output voltage signal of the second amplifier stage, for a range of high input signal levels applied to the first amplifier stage, the output voltage signal of the combining stage is representative of the output voltage signal of the first and second amplifier stages, and for a crossover range of input signal levels, applied to the first amplifier stage, which is intermediate the low range and the high range, the output voltage signal of the combining stage is representative of the output voltage signal of the second amplifier stage.

4,507,616

ROTATABLE SUPERCONDUCTING CYCLOTRON ADAPTED FOR MEDICAL USE

Henry G. Blosser, East Lansing; David A. Johnson, Williamston; Jack Riedel, East Lansing, all of Mich., and Richard J. Burleigh, Berkeley, Calif., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Mar. 8, 1982, Ser. No. 355,337
Int. Cl.[3] H05H *13/00*
U.S. Cl. 328—234 17 Claims



1. A superconducting cyclotron (**10**) apparatus including ion source means (**110**) for providing charged atomic particles to be spirally accelerated in the cyclotron with superconducting coils (**101, 102**) around iron magnetic poles (**110, 100***a*) and which can be cooled with a liquified gas to near 0° K., RF generator means (**24**) connected (**119**) to dees (**106, 107**) for spirally accelerating the charged atomic particles to generate a beam of particles or sub-particles from the spirally accelerated charged particles, the cyclotron including a support structure (**11**) rotatable around a pivot axis (A—A) for the cyclotron and balanced around the pivot axis by a counterweight (**14**) on the support structure to thereby change the angle of the beam wherein the beam can be directed towards the axis in an arc defining a plane of rotation of the cyclotron by the support structure, the improvement in the support structure which comprises:

(a) a balance bar (**13**) with two ends including a counterweight (**14**) at one end of the balance bar opposite a pivot axis (A—A) and a cross bar (**15**) member at the other end opposite the counterweight, perpendicular to the balance bar and parallel to the pivot axis for supporting the cyclotron mounted on one end of the cross bar such that the beam can be generated in a plane perpendicular to and in the direction of the pivot axis;

(b) pivot means (**16, 17**) supporting the balance bar at the pivot axis of the balance bar with the cyclotron and cross bar balancing the counterweight and with the pivot axis providing a fulcrum such that the balance bar is rotatable in an arc of about 180° in the plane perpendicular to the pivot axis;

(c) drive means (**18**) for rotating the balance bar in the arc as the beam is generated; and

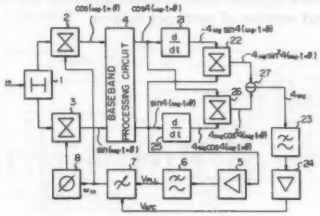
(d) flexible hose (**25**) attached at one end to the cross bar at an opposite end from the cyclotron for providing a liquified gas (**34**) cooled to near 0° K. through the hose to the cyclotron through an inlet conduit (**122**) supported by the cross bar with an opposite end (**31**) of the hose attached to a fixed base (**32**) providing a mounting surface (B—B) for the support structure wherein as the cyclotron is moved in the arc the hose bends between the base and cross bar.

4,507,617

CARRIER RECOVERY CIRCUIT FOR A PSK MODULATED SIGNAL

Susumu Sasaki, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 10, 1982, Ser. No. 406,940
Claims priority, application Japan, Aug. 10, 1981, 56-124872
Int. Cl.[3] H04L *27/22, 7/02;* H03L *7/08;* H03D *3/18*
U.S. Cl. 329—50 6 Claims



1. A carrier-wave recovery circuit for use in a demodulator for a 2^n-phase (n=1, 2, . . .) PSK modulated signal, comprising:

voltage-controlled oscillator means for generating first and second signals in phase quadrature;

first and second mixing means, operatively connected to said voltage-controlled oscillator means, for receiving said first and second signals, for mixing the PSK modulated signal with said first and second signals, respectively, and for generating respective first and second output signals;

baseband processing means, operatively connected to said first and second mixing means, for receiving and multiplying said first and second output signals by a factor of 2^n to generate third and fourth output signals respectively, in phase quadrature;

first and second differentiating means operatively connected to said baseband processing means, for receiving and differentiating said fourth and third output signals, respectively, and generating corresponding sixth and fifth output signals;

third mixing means, operatively connected to said first differentiating means, for receiving and mixing said sixth output signal with said third output signal and generating a seventh output signal;

fourth mixing means, operatively connected to said second differentiating means, for receiving and mixing said fifth output signal with said fourth output signal and generating an eighth output signal;

means, operatively connected between said third and fourth mixing means, for generating a difference signal corresponding to the difference between said seventh and eighth output signals;

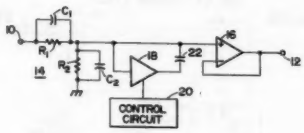
first control means, operatively connected to said baseband processing means and said voltage controlled oscillator means, for receiving said fourth output signal and for supplying a first control voltage in accordance with said fourth output signal, to said voltage-controlled oscillator means; and

second control means, operatively connected to said means for generating a difference signal and said voltage controlled oscillator means, for supplying a second control voltage in accordance with the value of said difference signal, to said voltage-controlled oscillator means.

4,507,618
COMPENSATION METHOD AND APPARATUS FOR AN RC ATTENUATOR

Theodore G. Nelson, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 4, 1982, Ser. No. 432,491
Int. Cl.[3] H03F 3/68; H01P 1/22
U.S. Cl. 330—126 12 Claims



1. A compensation apparatus for an attenuator having fixed resistors paralleled by fixed capacitors and an input and an output, said compensation apparatus comprising:

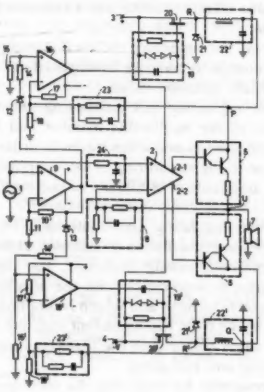
circuit means for controllably amplifying high frequency components of the output signal from said attenuator; and

summing means for algebraically summing the output of said circuit means with the output of said attenuator thereby to provided a frequency compensated output.

4,507,619
AMPLIFIER WITH SIGNAL-DEPENDENT VOLTAGE SUPPLY SOURCE

Jan Dijkstra, and Engel Roza, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,539
Claims priority, application Netherlands, Oct. 30, 1981, 8104914
Int. Cl.[3] H03F 3/21
U.S. Cl. 330—297 18 Claims

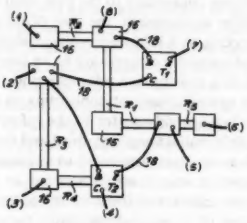


1. An amplifier with a signal-dependent supply voltage source comprising, an amplifier, a signal-dependent supply-voltage source coupled thereto so that the supply voltage of said source varies in accordance with a signal amplified by the amplifier, means for applying a portion of said signal to an input of a comparator having an output signal that controls a limiter, means for applying a portion of the limiter output signal as a feedback to a second input of the comparator through a filter and a feedback network connected in series so that a high frequency oscillation is produced in a feedback loop formed by the comparator, the limiter, the filter and the feedback network, whereby a signal-dependent modulation of the pulse width and/or the pulse density of a pulse-shaped output signal of the limiter is produced, and means coupling an output section of the amplifier to an output of said filter so as to derive a supply voltage for said amplifier output section from said filter output.

4,507,620
ULTRA-RAPID HYBRID LINEAR AMPLIFIER

Jacques Buisson, Bures sur Yvette, and Alain Loitière, Le Plessis Pate, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 1, 1981, Ser. No. 268,739
Claims priority, application France, Jun. 4, 1980, 80 12395
Int. Cl.[3] H03F 3/04
U.S. Cl. 330—307 7 Claims

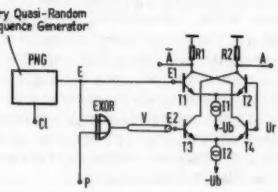


1. An ultra-rapid linear amplifier comprising an electronic microcircuit incorporating deposited resistors and active elements supported on an insulative substrate, having a very wide pass band and an ultra-rapid pulse rise time, said microcircuit comprising conducting metal layers deposited on said substrate and having a minimum metallization surface having a size with the same order of magnitude as the size of said active elements for providing connection to an electrical link between the different components of said microcircuit and the different electrical input and output points of the amplifier and the pins of a box in which said amplifier is implanted, said points being provided solely by conducting wires coming into contact with the metallization surface without any contact with the substrate.

4,507,621
GENERATING QUASI-RANDOM SEQUENCES IN AMI CODE

Fritz Meyer, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,947
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224442
Int. Cl.[3] H03B 29/00
U.S. Cl. 331—78 4 Claims



1. An arrangement for generating quasi-random sequences in AMI code, comprising:

generator means for creating binary quasi-random sequences;

a differential amplifier arrangement comprising first and

second differential amplifiers, the first differential amplifier having first and second transistors and a first input, the second differential amplifier having third and fourth transistors and a second input;

an exclusive OR gate (EXOR) having two inputs and an output, the one input being connected to an output of the generator means and the other input connecting to a control terminal;

the output of the exclusive OR gate being connected over a time-delay element to the second input of the differential amplifier arrangement;

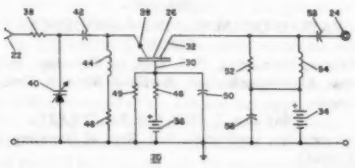
the first differential amplifier, first and second transistors having their emitters connected to one another and to an operating voltage via a first current source, a base of the first transistor connecting to the first input of the differential amplifier arrangement, the base of the second transistor connecting to a reference voltage source, a collector of the first transistor connecting to an inverse output and also via a first resistor to a reference potential, the collector of the second transistor connecting to a signal output and also via a second resistor to the reference potential;

the second differential amplifier, third and fourth transistors having their emitters connected to one another and via a second current source are connected to said operating voltage, the collector of the third transistor connecting to the collector of the second transistor, the collector of the fourth transistor connecting to the collector of the first transistor, the base of the fourth transistor connecting to the base of the second transistor, and the base of the third transistor connecting to the second input of the differential amplifier arrangement.

4,507,622
OSCILLATOR UTILIZING INDUCTIVE PARAMETER OF TRANSISTOR

Robert N. Muth, East Northport, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Nov. 29, 1982, Ser. No. 445,337
Int. Cl.³ H03B 7/00
U.S. Cl. 331—115 **11 Claims**



1. An oscillator comprising:

a. a transistor coupled in a grounded-base configuration, said transistor being characterized by a scattering matrix wherein a reflection coefficient measured across terminals of a base-emitter junction of said transistor has a negative resistive component and a positive angle over a range of oscillation frequency, said range being dependent on a bias electric current impressed through said base-emitter junction, said positive angle of relection coefficient being indicative of inductance within said base-emitter junction in said oscillation frequency range;

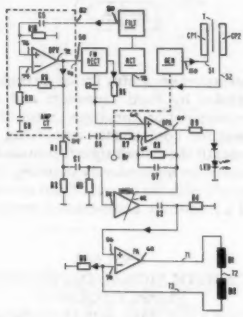
b. Capacitive means coupled across terminals of said base-emitter junction for resonating with said inductance at frequencies within said oscillation frequency range; and

c. means coupled across terminals of a base-collector junction of said transistor for extracting an output signal of said oscillator at a frequency within said oscillation frequency range.

4,507,623
OSCILLATING DEVICE WITH CAPACITIVE DISPLACEMENT PICKUP

Guido Fosco, Spreitenbach, and Karl Schmutz, Zurich, both of Switzerland, assignors to Siemens-Albis AG, Zurich, Switzerland

Filed Nov. 12, 1982, Ser. No. 441,073
Claims priority, application Switzerland, Nov. 20, 1981, 7446/81
Int. Cl.³ H03B 5/30
U.S. Cl. 331—154 **11 Claims**



2. An oscillating device comprising:

an oscillatable member which has a resonant frequency of oscillation;

a drive means for supplying the oscillatable member with make-up energy to maintain its amplitude of oscillation at a substantially constant value;

an electronic regulating unit monitoring said amplitude of oscillation of the oscillatable member and being operatively connected to said drive means in order to maintain, in response to the monitoring of said amplitude of oscillation, said amplitude of oscillation of said oscillatable member at said substantially constant value;

said electronic regulating unit containing, for monitoring said amplitude of oscillation of said oscillatable member, a variable-position sensing capacitor, the capacitance of which varies in accordance with the angular position of the oscillatable member and which is supplied, in use, with a sensing signal from the regulating unit, the frequency of which is much higher than the resonant frequency;

said regulating unit including:

a signal generator for supplying the sensing signal;

a first rectifier and a first filter which are serially connected to an input of an amplifier circuit which effects a phase displacement compensation;

a full-wave second rectifier connected to one signal input of an operational amplifier and a second filter connected to an input of a variable-gain amplifier, a control terminal of which is connected to an output of the operational amplifier and an output of which is connected to the drive means;

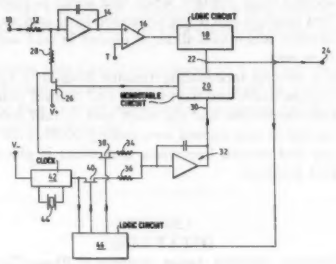
said amplifier circuit having an output means connected to the full-wave second rectifier and the second filter; and

the position sensing capacitor has two plates, one of which is connected to the signal generator and the other is connected to the first rectifier.

4,507,624
VOLTAGE-TO-FREQUENCY CONVERTERS

Anthony J. Ley, Sceaux, and Alain Bazin, Villejuif, both of France, assignors to Enertec, Montrouge, France

Filed Jan. 10, 1983, Ser. No. 456,891
Claims priority, application France, Jan. 29, 1982, 82 01401
Int. Cl.[3] H03K *13/02*
U.S. Cl. 332—11 D 2 Claims



1. In a voltage-to-frequency converter of the type including integrator means for receiving an input voltage signal and for producing an output signal therefrom, comparator means responsive to the integrator means for comparing the output signal of said integrator means with a predetermined threshold value, and means responsive to the comparator means for generating and applying feedback pulses to the integrator means of opposite polarity to that of said input voltage signal and at such a frequency as to maintain the output signal of the integrator means in a predetermined relationship to said threshold value, a method of controlling said feedback pulses, comprising the steps of:

(a) generating a series of reference pulses;

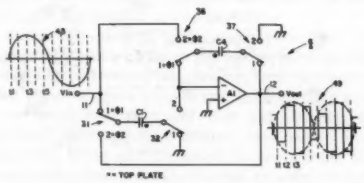
(b) comparing said reference pulses with said feedback pulses; and

(c) controlling the feedback pulse generating means to maintain the pulse-width of said feedback pulses in a predetermined relationship with the pulse-width of said reference pulses.

4,507,625
SWITCHED CAPACITOR AM MODULATOR/DEMODULATOR

Man S. Lee, San Mateo, and Chieh Chang, Belmont, both of Calif., assignors to GTE Communications Systems Corporation, Phoenix, Ariz.

Filed Jun. 28, 1982, Ser. No. 392,972
The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.
Int. Cl.[3] H03C *1/02;* H03K *7/00*
U.S. Cl. 332—31 R 10 Claims



1. An integrable switched capacitor circuit capable of performing amplitude modulation and/or demodulation, comprising:

an input line adapted for receiving an input signal voltage,

an operational amplifier having an input terminal and an output terminal,

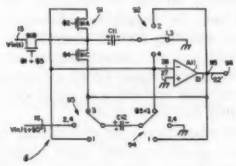
first and second capacitors C1 and C2 having one and other sides thereof, and

switch means associated with said capacitors and being alternately operative in first and second non-overlapping switch states, which are closed conditions of switching; operation of said switch means in the first switch state electrically connecting the one and other sides of C1 to said input line and ground for charging C1 with the input voltage on said input line while electrically connecting the other and one sides of C2 to said input and output terminals for impressing an input signal voltage sample on C2, that is obtained during the preceeding second switch state, across said amplifier for causing the latter to produce on said output terminal an inverted sample of the input signal voltage throughout the first switch state; operation of said switch means in the second switch state electrically connecting the other and one sides of C2 to said input line and ground for charging C2 with the input voltage on said input line while electrically connecting the other and one sides of C1 to said input and output terminals for impressing the input signal voltage sample on C1, that is obtained in the preceeding first switch state, across said amplifier for causing the latter to produce on said output terminal a non-inverted sample of the input signal voltage throughout the second switch state.

4,507,626
SWITCHED CAPACITOR SSB MODULATOR

Chieh Chang, Belmont, and Man S. Lee, San Mateo, both of Calif., assignors to GTE Lenkurt Incorporated, Phoenix, Ariz.

Filed Jun. 28, 1982, Ser. No. 392,973
Int. Cl.[3] H03C *1/02;* H03K *7/00*
U.S. Cl. 332—31 R 14 Claims



1. An integrable switched capacitor single-sideband modulator comprising:

an operational amplifier having an input terminal and an output terminal;

first and second capacitors C1 and C2;

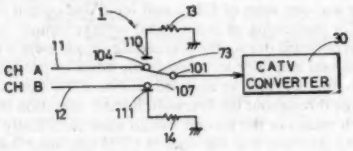
first means responsive to a baseband input signal for producing first and second quadrature phase signal voltage representations thereof; and

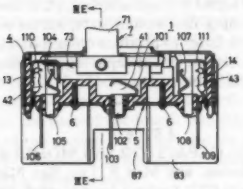
switch means periodically operative in combination with said amplifier in non-overlapping switch states which occur sequentially at a prescribed rate, adjacent pairs of switch states being defined as those occuring in adjacent pairs of different and distinct ones of four consecutive time slots, for alternately charging C1 and C2 with associated ones of the first and second signal voltages in first and second time slots, respectively, of each adjacent pair thereof for obtaining sample voltages, and alternately connecting C1 and C2 as feedback capacitors across input and output terminals of said amplifier in second and first time slots, respectively, of each adjacent pair thereof with the capacitor charge voltages across said amplifier being of a polarity causing said amplifier to produce a single-sideband signal on said output terminal.

4,507,627
CATV SYSTEM

Katsuo Ito; Bunjiro Murata, both of Kanazawa, and Kazunori Yoshimura, Sumiyoshi, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 9, 1982, Ser. No. 448,372
Claims priority, application Japan, Dec. 12, 1981, 56-200303; Dec. 28, 1981, 56-197528[U]; Dec. 28, 1981, 56-197529[U]
Int. Cl.³ H01F 1/10
U.S. Cl. 333—105 9 Claims





1. A CATV system comprising:

(A) first and second lines, one end of each of said lines being coupled to a central unit for transmitting information from said central unit to a terminal unit; and

(B) a selecting switch for selecting one of said first and second lines for supplying information to said terminal unit, said selecting switch comprising:

(1) a shield case, said shield case including a resin case and a case member made up of a conductive material, said case member including an outer case and an inner case covering said resin case;

(2) shield plate means for partitioning the interior defined by said shield case into three compartments, a middle compartment, a first compartment adjacent to one side of said middle compartment, and a second compartment adjacent to the other side of said middle compartment;

(3) a slider provided in said shield case and slidable between a first position wherein said slider extends into said first compartment and a second position wherein said slider extends into said second compartment, said slider being located at least partially in said middle compartment both when it is in said first position and when it is in said second position;

(4) a common contact connected to said terminal unit and housed in said middle compartment and normally placed in electrical contact with said slider;

(5) a first fixed contact housed in said first compartment and connected to said first line and placed in electrical contact with said slider and electrically connected to said common contact when said slider is in said first position;

(6) a first terminating contact housed in said first compartment and placed in electrical contact with said first fixed contact when said slider is placed in said second position; said first terminating contact being separated from said first fixed contact when said slider is placed in said first position;

(7) a first terminating resistor housed in said first compartment and having one end thereof connected to said shield case and the other end thereof directly connected to said first terminating contact for terminating said first line when said slider is placed in said second position;

(8) a second fixed contact housed in the second compartment and connected to said second line and being placed in electrical contact with said slider and electrically connected to said common contact when said slider is placed in said second position;

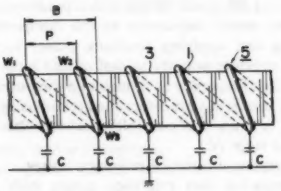
(9) a second terminating contact housed in said second compartment and placed in electrical contact with said second fixed contact when said slider is placed in said first position and being separated from said second fixed contact when said slider is placed in said second position; and

(10) a second terminating resistor housed in said second compartment and having one end thereof connected to said shield case and the other end thereof directly connected to said second terminating contact for terminating said second line when said slider is placed in said first position.

4,507,628
DELAY LINE

Kazuo Kameya, Saitama, Japan, assignor to Elmec Corporation, Japan

Filed Jul. 13, 1983, Ser. No. 513,493
Claims priority, application Japan, Jul. 14, 1982, 57-122629
Int. Cl.³ H03H 7/32
U.S. Cl. 333—138 5 Claims

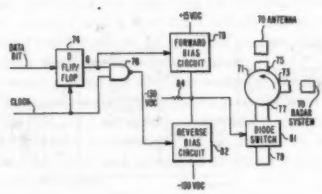


1. A delay line, comprising; an inductance element formed of a coiled conductor and a plurality of capacitors connecting said conductor to ground, said conductor of said inductance element being coiled in the shape of a single-layer solenoid with adjacent turns of said conductor being spaced from one another, a one-turn pitch P and a half-turn pitch B of said inductance element being selected so as to satisfy the relation, $B/P \geqq 1.0$.

4,507,629
MICROWAVE PHASE SHIFTER

Gilbert H. Frank, Clarksville, Md.

Filed Mar. 1, 1983, Ser. No. 471,089
Int. Cl.³ H01P 1/18
U.S. Cl. 333—164 2 Claims



1. A phase shifter comprising:

(a) a multi-port circulator having at least first, second and third ports;

(b) reflective termination means coupled to at least one of

said ports to reflect signals emerging from said at least one port to said at least one of said ports to introduce a predetermined phase shift in said signals emerging from said at least one port;

(c) a switching diode for introducing a predetermined change in said phase shift; and

(d) a drive circuit comprising:

(1) a storage element responsive to a data signal and a clock signal;

(2) a forward bias circuit responsive to a first state of said storage element to provide a forward bias to said diode; and

(3) a reverse bias circuit responsive to a second state of said storage element and a clock signal to provide a reverse bias current pulse and a sustaining cutoff voltage bias to said diode.

4,507,630

NOISE FILTER FOR CONNECTORS

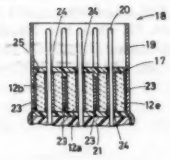
Kikuo Wakino, Muko, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 17, 1983, Ser. No. 458,752

Claims priority, application Japan, Jan. 18, 1982, 57-5391[U]

Int. Cl.³ H03H *7/00, 7/01;* **H01R** *13/66;* **H01G** *4/38*

U.S. Cl. 333—182 **23 Claims**



1. A connector having a built in noise filter, said connector comprising:

a plurality of cylindrical capacitors each having an inner peripheral surface defining a throughgoing hole, an outer peripheral surface opposed to said inner peripheral surface, an inner electrode formed on said inner peripheral surface and an outer electrode formed on said outer peripheral surface;

a plurality of connection pins;

first means external to said capacitors for orienting said connection pins in a desired pattern with said pins being spaced apart and parallel to one another;

second means for orienting said capacitors so that their throughgoing holes are located in a pattern corresponding to said desired pattern and said pins may be simultaneously inserted into respective ones of said throughgoing holes, each pin being associated with that said capacitor into whose throughgoing hole it extends, said second means mechanically fixing said capacitors to one another such that each said cylindrical capacitor has its outer electrode in electrical and physical contact with at least one adjacent cylindrical capacitor; and

third means for electrically connecting each said pin to said inner electrode of its associated capacitor when said pins have been inserted into said throughgoing holes.

4,507,631

DEVICE COMPRISING A CAVITY AND A LINEAR RESONATOR FIXED WITHIN SAID CAVITY, AND A METHOD OF ASSEMBLY OF SAID DEVICE

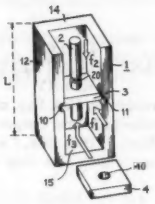
Daniel Louet, and Gilbert Darnois, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 22, 1982, Ser. No. 452,132

Claims priority, application France, Dec. 23, 1981, 81 24158

Int. Cl.³ H01P *11/00, 7/04, 7/06*

U.S. Cl. 333—222 **5 Claims**



1. A device comprising a cavity having an internal wall, and within said cavity a linear resonator of given length and a support for maintaining said resonator in position within said cavity, said support being formed by a plate of plastic material which has been subjected to thermocompression, said support being in contact with the internal wall of the cavity and being pierced by a hole in which a portion of the resonator is introduced, wherein m (m being a whole number at least equal to 1) recesses for securing the support are formed in the cavity wall which is in contact with said support, wherein n (n being a whole number at least equal to 1) recesses for securing said support are formed in that portion of the resonator which is introduced within the hole and wherein said recesses are filled with the support material as a result of thermocompression of said support.

4,507,632

ELECTROMAGNETIC WAVE SWITCH

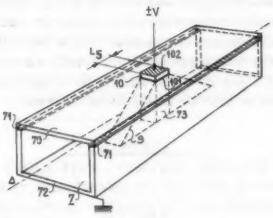
Michel Baril, and Gilles Sillard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,708

Claims priority, application France, Aug. 21, 1981, 81 16120

Int. Cl.³ H01P *1/15*

U.S. Cl. 333—258 **6 Claims**



1. An electromagnetic wave switch formed by a rectangular wave-guide having a longitudinal axis associated with a semiconductor, wherein said wave-guide has dimensions which allow propagation of millimeter waves, said wave-guide switch comprising:

a step centrally formed in said wave-guide and defining a ridged space, of given volume;

a bar of semiconductor material disposed in said ridged space of said wave-guide formed by said step, said bar having a high breakdown voltage and low thermal resis-

tance wherein the volume of said bar is identical to that of said ridged space and wherein said wave-guide is formed in a first and a second part with said first part being a flat metal plate and said second part being a U-shaped metal plate on which said step is formed so that the joining together of said first and second parts form the cavity of the wave-guide and said first and second parts are insulated by a layer of insulating material.

4,507,633

SEALING MEANS FOR AN ELECTROMAGNETIC RELAY

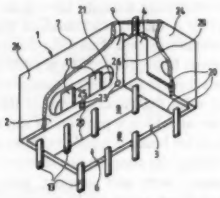
Werner Minks, Heroldsberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,109

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308821

Int. Cl.³ H01H *13/04*

U.S. Cl. 335—202 **6 Claims**



1. In an electromagnetic relay having a housing comprising a substantially cup-like lower housing member and a cup-like cover, said lower housing member containing the magnet system, the contact and connecting systems, and the terminals of the relay, said lower housing member having sidewalls and a bottom, and terminals extending downwardly from said bottom, said lower housing member having walls extending at least down to the bottom of the lower housing member, the improvement comprising:

at least one recess in at least one of said sidewalls, said recess extending through said sidewall above said bottom for introducing a pourable sealing compound into said lower housing member, said recess being covered by one of said walls of said cover; and

at least one sidewall of said lower housing member having at least one opening extending down to said bottom for permitting sealing compound to flow from the interior of said lower housing member outwardly through said opening to the gap between said walls of said cover and said sidewalls to provide a seal therebetween.

4,507,634

FORCE MOTOR WITH NULL CENTERING AND NULL POSITION BIAS

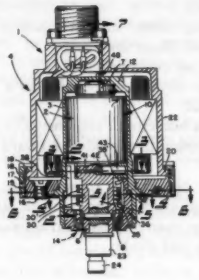
Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Apr. 28, 1983, Ser. No. 489,237

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—272 **20 Claims**

1. A force motor comprising a rotor casing containing a rotor assembly, a stator assembly surrounding said rotor casing, said rotor assembly including a rotor shaft, and absorbing means contained within said rotor casing for absorbing the inertia of said rotor assembly as said rotor assembly nears the end of its stroke, said absorbing means comprising a leaf spring



in said rotor casing engageable by a stop shoulder on said rotor assembly as said rotor assembly nears the end of its stroke.

4,507,635

MAGNETIC ANCHORING APPARATUS WITH QUADRANGULAR POLE ARRANGEMENT

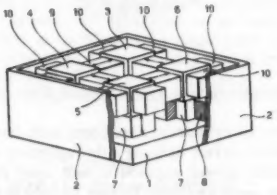
Michele Cardone; Angelo Grandini, and Bruno Zaramella, all of Milan, Italy, assignors to Tecnomagnetica di Cardone, Grandini, Zaramella & C.S.a.s., Italy

Filed Nov. 15, 1983, Ser. No. 551,793

Claims priority, application Italy, Nov. 16, 1982, 23483/82[U]

Int. Cl.³ H01F *7/20*

U.S. Cl. 335—291 **9 Claims**



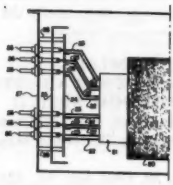
1. Magnetic anchoring apparatus, comprising in combination: an external ferromagnetic crown provided with a base plate and lateral walls; at least one group of four pole pieces defining pairs of corresponding poles of an anchoring surface, said pole pieces presenting their longitudinal axes arranged at right angles to the base plate and in correspondence with the apexes of a square; the apparatus comprises moreover a plurality of permanent magnets for feeding the aforesaid poles, interposed between the pole pieces and, respectively, between the latter and the ferromagnetic crown, the arrangement of the magnets, for each pole piece, being such as to have a main magnet, axially aligned with the pole piece, which provides a first magnetic flux value, as well as laterally arranged secondary magnets which surround the pole piece, and whose axes of magnetization are arranged perpendicular to the axis of the pole piece itself, said secondary magnets together providing a magnetic flux substantially equal to the flux of the main magnet.

4,507,636

NEUTRAL POINT PLATE OF THREE-PHASE TRANSFORMER FOR LARGE SECONDARY CURRENTS

Odd J. Eilertsen, and Ottar H. Svensen, both of Sarpsborg, Norway, assignors to National Industri A/S, Drammen, Norway

Filed Feb. 23, 1984, Ser. No. 582,927
Claims priority, application Norway, Sep. 23, 1983, 833430
Int. Cl.[3] H01F *33/00, 15/04*
U.S. Cl. 336—12 4 Claims



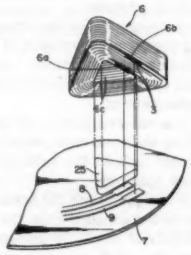
1. Three phase transformer for large secondary currents, for example arc furnace transformer, the secondary winding of which is star connected, characterized in that the neutral point of the secondary winding is constituted by a neutral point plate screened against the transformer tank wall by a screen plate, and to which the neutral point tappings of the secondary winding are connected, and that the phase tappings of the secondary winding are passed through both neutral point plate and screen plate and connected to heavy current insulating ducts extending through the transformer tank wall.

4,507,637

COIL FOR ELECTRIC MOTOR

Tsuneyuki Hayashi, Chigasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 356,164, Mar. 8, 1982, abandoned, which is a continuation of Ser. No. 188,520, Sep. 18, 1980, abandoned. This application Jul. 25, 1984, Ser. No. 634,178
Claims priority, application Japan, Sep. 27, 1979, 54-124370
Int. Cl.[3] H01F *15/02, 15/10*
U.S. Cl. 336—65 4 Claims



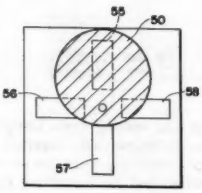
1. A wound coil mounted on a plane painted circuit board for an electric motor comprising, wire with a conductive core and insulating film formed on the conductive core, said coil formed of wire which is wound substantially in the shape of a triangle, and said coil having a substantially triangular opening and said coil having at least one end plane surface in which the beginning and ending ends of said wire lie, and a pair of electrodes on or near the beginning and ending ends of said wire and formed by removing insulating film from said wire to bare said wire and said electrodes substantially located within the confines of said coil in said one end plane surface, wherein said wire has an adhesive film formed over said insulating film which binds said coil together, and wherein a first one of said pair of electrodes is located adjacent said triangular opening and a second one of said pair of electrodes is located at the outer surface of said coil remote from said triangular opening, wherein said first and second ones of said pair of electrodes are parallel to adjacent wire windings, and in which said electrodes are soldered to circuit patterns of said printed circuit board.

4,507,638

ROTARY POSITION SENSORS EMPLOYING PLANAR COILS

Amnon Brosh, 16 Sunnyside Dr., Montvale, N.J. 07645

Filed Dec. 10, 1981, Ser. No. 329,284
Int. Cl.[3] H01F *21/02*
U.S. Cl. 336—79 5 Claims



1. A rotary displacement transducer, comprising:

(a) a first planar member having disposed on a surface thereof four flat coil configurations each occupying a predetermined area on said surface and each located at 90° intervals with respect to one another and defining four quadrants,

(b) a second planar member having disposed thereon four additional flat coil configurations each one aligned with and complimentary to an associated coil on said first planar member when said second planar member is positioned apart from said first member and relatively parallel to and facing said first member to form a space therebetween, whereby any magnetic field induced in one of said members can couple to the other,

(c) a rotatable plate of a circular configuration and positioned in the space between said members and located to rotate about an axis eccentric to the center of said plate to cause said plate to fully cover only one of said coils and to partially cover two other coils as it rotates and fabricated from a material sufficient to block said magnetic field, said plate to provide, when rotated, magnetic field coupling between two opposite coils having an output indicative of a sinusoidal output with the coupling between the other two opposite coils indicative of a cosine output, whereby any two of said coils can provide quadrant identification for output signals taken from said two other coils.

4,507,639

INDUCTIVE POSITION SENSOR

George Trenkler, East Providence, R.I., and Lawrence E. Cooper, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 106,773, Dec. 26, 1979, Pat. No. 4,401,986. This application May 13, 1983, Ser. No. 494,154
Int. Cl.[3] H01F *21/04*
U.S. Cl. 336—115 1 Claim

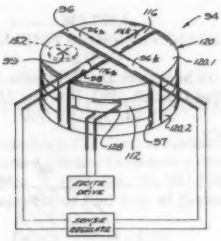
1. A non-contact joy-stick type position sensor comprising

an exciting coil having at least one convolution lying substantially in a first plane,

one sensing coil having at least one convolution lying substantially in a second plane intersecting the first plane, said one sensing coil having a pair of portions of said convolution disposed substantially symmetrical relative to a por-

tion of the exciting coil in mutually inductive relation to said exciting coil, and

a second sensing coil having at least one convolution lying substantially in a third plane intersecting the first and second planes, said second sensing coil having a pair of portions thereof disposed substantially symmetrically relative to a portion of the exciting coil in mutually inductive relation to the exciting coil,



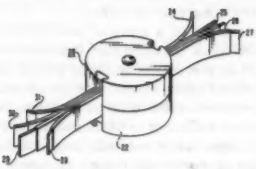
said exciting and sensing coils being mounted relative to each other to be movable together relative to a mutual inductance modifying means on an object whose position is to be monitored for modifying the mutual inductance between said pairs of portions of each of said two sensing coils and said exciting coils during such relative movement so that, when the exciting coil is driven, the two sensing coils provide separate signals representative of the position of the object relative to the coils.

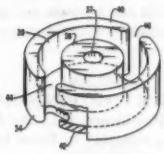
4,507,640

HIGH FREQUENCY TRANSFORMER

Edward L. Rich, III, Arnold, Md., and Yucel Y. Yalim, Coral Springs, Fla., assignors to Westinghouse Electric Co., Pittsburgh, Pa.

Filed Nov. 26, 1982, Ser. No. 444,637
Int. Cl.³ H01F *27/28*
U.S. Cl. 336—223 **4 Claims**





1. A transformer comprising in combination:

(a) a core, said core including first and second sections each having a first substantially flat end and a second end, said second end including a groove surrounding a central portion and an outer portion separated from said central portion by said groove, said second end of said first and second sections adjacently positioned defining a closed magnetic path;

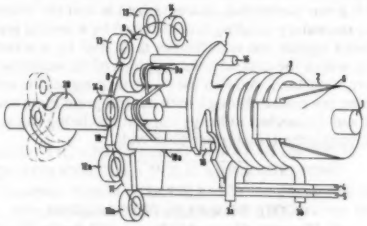
(b) a plurality of windings each encircled by said closed magnetic path, each winding comprising a substantially flat electrically conductive ribbon selectively covered with an electrically insulating layer, each ribbon having a central portion, a connecting portion and a terminal portion, said connecting portion joining said central and said terminal portions such that said terminal portion is substantially parallel to said central portion and off-set therefrom permitting a plurality of said ribbons to be wound such that the edges of said plurality of ribbons are in substantially the same plane to form windings with said connecting portions being folded over the edge of said windings with said terminal portions emerging from said windings in a selected order such that the edges of said terminal portions are in substantially the same plane.

4,507,641

DRIVING MECHANISM FOR A THREE-POSITION ELECTRICAL SWITCH

Rainer Poth, Bad Vilbel, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 29, 1983, Ser. No. 526,948
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239839
Int. Cl.³ H01H *85/00*
U.S. Cl. 337—6 **2 Claims**



1. A driving mechanism for a three-position electrical switch, comprising:

a jump-drive sub-assembly having a switching shaft which is rotatable between ON, OFF and EARTH switching positions;

a pivotable actuator operable to rotate the switching shaft between its switching positions;

a spring arrangement coupled with the actuator and operable to store spring energy upon rotation of the actuator in either direction from a mean position;

a detent arrangement coupled with the switching shaft and with the spring arrangement;

a circumferentially spaced arrangement of latches disposed around the switching shaft and engageable with the detent arrangement in order to hold the switching shaft in any one of its switching positions;

a release arrangement coupled with the actuator and operable, upon rotation of the actuator from the mean position through a predetermined angle, to disengage the detent arrangement from the latch arrangement and thereby allow the stored spring energy to act upon the switching shaft to rotate the latter rapidly to the ON position or to the EARTH position depending upon the direction of rotation of the actuator; and

a storage drive assembly coupled with the switching shaft and having a disconnecting spring which is operable to release a stored spring force when a fuse of a fusing arrangement is blown or when an open circuit trip of a shunt trip arrangement has occurred;

wherein the switching shaft is operable automatically by the storage drive sub-assembly when a fuse is blown or when an open circuit trip has occurred, and the switching shaft is operable manually via the jump drive sub-assembly.

4,507,642

SNAP-ACTING THERMALLY-RESPONSIVE BIMETALLIC ACTUATORS

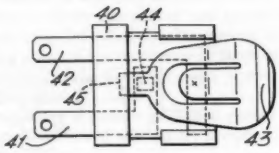
Arthur M. Blackburn, Buxton, England, assignor to Otter Controls Limited, Buxton, England

Filed Jul. 26, 1983, Ser. No. 517,300

Claims priority, application United Kingdom, Jul. 29, 1982, 8221922

Int. Cl.³ H01H *37/54*

U.S. Cl. 337—89 **12 Claims**



1. A snap-acting thermally-responsive bimetallic actuator for use in actuating the switch contacts of a thermally-responsive electric switch, the actuator comprising a generally pear-shaped bimetallic blade having a larger end portion, an opposite smaller end portion, and an intermediate portion of graded size extending between said larger and smaller end portions, said blade being stressed so as to be movable with temperature change between two oppositely dished configurations, and a generally U-shaped cut-out being provided principally in the intermediate portion of the blade so as to release therefrom a tongue having a root or attached end adjacent the larger end portion of the pear-shaped blade and a tip or fee end adjacent the smaller end portion, and the tongue extending between two outer leg portions of the intermediate portion of the blade which each have a width at the smaller end portion of the blade less than their width at the larger end portion of the blade.

4,507,643

GAS SENSOR WITH IMPROVED PEROVSKITE TYPE MATERIAL

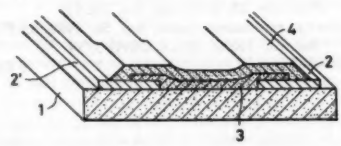
Naomasa Sunano, 2-12-14, Sawano-nishi, Akashi-shi, Hyogo-ken; Naotatsu Asahi, 3-16-19, Higashiohshima, Katsuta-shi, Ibaraki-ken, and Toshio Yoshida, 173-14, Kamihiruta, Kasukabe-shi, Saitama-ken, all of Japan

Filed Jul. 28, 1983, Ser. No. 518,110

Claims priority, application Japan, Aug. 6, 1982, 57-136244

Int. Cl.³ G01N *27/12*

U.S. Cl. 338—34 **16 Claims**



1. In a gas sensor comprising a layer of a sensitive material formed on an electric insulative substrate and electrodes electrically connected to said layer of sensitive material, the improvement wherein said layer of sensitive material is formed of a porous film consisting of a uniform mixture which contains a p-type compound oxide semiconductor with a perovskite type of crystal structure as the major ingredient and one or more materials selected from the group consisting of vanadium, niobium, tantalum and compounds thereof as minor ingredients, and wherein said layer of sensitive material has a thickness of 0.5 to 50 microns; said one or more materials selected from the group consisting of vanadium, niobium, tantalum and compounds thereof is contained in an amount of 0.01 to 5% by weight, based on the weight of the p-type compound semiconductor and is incorporated in the layer by diffusing said one or more materials selected from the group consisting of vanadium, niobium, tantalum and compounds thereof into the layer of said p-type compound oxide semiconductor; and said electrodes are electrically connected to said layer in remote relation to each other.

4,507,644

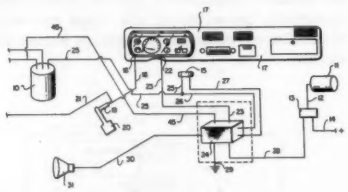
TOUCH RESPONSIVE SECURITY AND ANTITHEFT SYSTEM

John C. Abrahamson, Salt Lake City, Utah, assignor to Custom Touch Electronics, Salt Lake City, Utah

Filed Mar. 10, 1983, Ser. No. 474,816

Int. Cl.³ B60R *25/04*

U.S. Cl. 340—64 **20 Claims**



1. A security or antitheft mechanism or device for use with motor vehicles having an electrical energy supply means, an ignition switch, and an ignition circuit including an ignition coil and means for electrically connecting the ignition switch, and the ignition coil in series with the electrical supply means and ground, said security or antitheft mechanism or device comprising:

an exposed electrically conductive element;

at least one touch pole which is electrically conductive, is insulated from ground and is exposed for touching; and

a control circuit which is interposed in the ignition circuit and is adapted to monitor the touch pole, said control circuit also being adapted to inactivate the ignition circuit and thus the motor vehicle by shorting the ignition coil to ground and thus effectively disabling the ignition coil whenever the ignition switch is turned off and to thereafter reactivate the ignition circuit by breaking the short to ground upon establishing electrical communication between said exposed electrically conductive element and said touch pole,

whereby following the turning off ot said ignition switch, the ignition circuit and the motor vehicle are rendered inoperable until the short to ground is broken by touching said electrical conductive element with an electrically conductive lead, and while still touching said exposed electrically conductive element with said electrically conductive lead also touching said touch pole with said electrically conductive lead.

4,507,645

ASSEMBLY FOR THE TRANSMISSION OF CONTROL SIGNALS TO AND/OR FROM MOBILE EQUIPMENT

Rainer Kehl, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,145

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3311010

Int. Cl.³ H04M *11/04*

U.S. Cl. 340—310 A **6 Claims**

1. In an electrochemical apparatus having a working mobile component, a controlling stationary component, a stationary power source, an electrical cable extending from the power

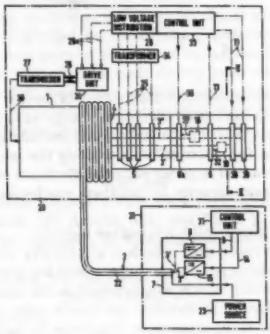
source to the mobile component for feeding electrical power thereto and a drum rotatably mounted to one of said components for taking up slack in said cable, said cable being windable about said drum and having a flexible insulating sheath; an assembly for controlling said mobile component, comprising:

signal producing control means on the stationary component for generating electrical signals containing encoded information relating to the utilization of electric power in moving the mobile component;

power distribution means disposed on said mobile component and operatively connected to the electrical cable for distributing the power therefrom;

signal using control means disposed on said mobile component and operatively connected to said power distribution means for controlling the operation thereof in response to information coded in said electrical signals;

first signal transforming means including a first electro-optical transducer mounted on said stationary component and operatively connected to said signal producing control means for converting said electrical signals into optical signals;



second signal transforming means including a second electro-optical transducer for converting said optical signals back into electrical signals, said second signal transforming means being mounted on said mobile component and operatively coupled to said signal using control means;

optical transmission means including at least one optical fiber extending longitudinally through the insulating sheath of the electrical cable for carrying said optical signals from said first signal transforming means to said second signal transforming means, said optical fiber having an input end engaging said first electro-optical transducer and an output end engaging said second electro-optical transducer; and

electrical transmission means for transmitting electrical signals between said second electro-optical transducer and said signal using control means, said electrical transmission means including a slip ring mounted to the cable-slack take-up drum and an electrically conductive brush engaging said slip ring and operatively connected to said signal using control means, said second electro-optical transducer being mounted to said drum and electrically coupled to said slip ring.

4,507,646

RADIO COMMUNICATION SYSTEM

Inge Hamlin, and André Beudat, both of Stockholm, Sweden, assignors to P.S. Paging System, A.B., Stockholm, Sweden

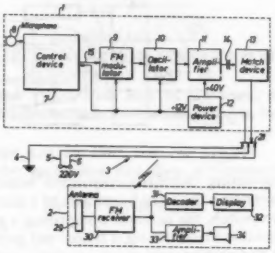
PCT No. PCT/SE82/00384, § 371 Date Jul. 21, 1983, § 102(e) Date Jul. 21, 1983, PCT Pub. No. WO83/01877, PCT Pub. Date May 26, 1983

PCT Filed Nov. 12, 1982, Ser. No. 522,377

Claims priority, application Sweden, Nov. 16, 1981, 8106805

Int. Cl.³ H04M *11/04*

U.S. Cl. 340—310 R **6 Claims**



1. A paging system for a structure having a common AC power network comprising:

a transmitting unit including:

an oscillator for providing a radio frequency carrier wave;

a modulator for applying an information signal to said carrier wave;

a power amplifier for amplifying the signal modulated carrier wave;

a power supply for providing operating current to said transmitting unit from said AC power network;

connect/disconnect means for coupling said power amplifier output signal and said power supply means to said AC power network whereby said network radiates said coupled output signal through said structure; and

at least one receiving unit having an antenna and demodulating circuit for receiving and demodulating said radiated signal.

4,507,647

ENCODER

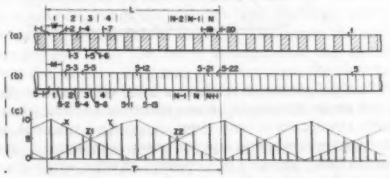
Masana Minami, Kawasaki; Hiroshi Tamaki, Tokyo; Tsuneo Sasaki, Tokyo, and Kazuaki Kimura, Tokyo, all of Japan, assignors to Tokyo Kagaku Kikai K.K., Tokyo, Japan

Filed Apr. 23, 1981, Ser. No. 256,928

Claims priority, application Japan, Apr. 30, 1980, 55-57281

Int. Cl.³ H03K *13/18;* **G01D** *5/34*

U.S. Cl. 340—347 P **5 Claims**



1. An apparatus for correcting the vernier relationship between a code plate and a sensor array of an encoder, comprising:

a sensor array in which a plurality of sensor elements are periodically arranged;

a code plate which has a periodic lattice pattern having lattice pattern information of "1" and "0" alternately;

projection means for projecting an image of the lattice pattern arrangement of said code plate onto said sensor array in unitary projected period of said code plate differing from a period of said sensor array;

means for extracting a period of a time serial output signal which has periodicity, and which comprises a first detection means for detecting an envelope of the output of even numbered sensor elements of said sensor array, a second detection means for detecting an envelope of the output of odd numbered sensor elements of said sensor array, and calculating means for calculating the interval between the intersecting point of the envelopes detected by said first and second detection means by pulse signals generated from an oscillator;

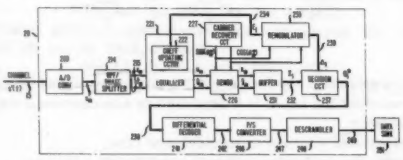
means for obtaining a unitary projected period from said output signal period and said unitary period of said sensor array; and

correction means for correcting the vernier relationship of said code plate and said sensor array based on the amount of variation between the obtained projected period and a predetermined reference projected period.

4,507,648
DECODING TECHNIQUE FOR MULTIDIMENSIONAL CODES

John H. Conway, Cambridge, England, and Neil J. A. Sloane, Highland Park, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 8, 1982, Ser. No. 346,626
Int. Cl.[3] H03K *13/24*
U.S. Cl. 340—347 DD 8 Claims



1. Circuitry for use in a data communication system in which inputted data signals are modulated onto a carrier signal to generate a modulated signal representative of one of a predetermined plurality of n-dimensional codewords and in which said modulated signal is supplied to a data communication channel, said circuitry comprising

means for receiving from said data communication channel said modulated signal,

means for demodulating said received modulated signal to generate a signal representative of an n-dimensional point X_i, said plurality of codewords being a selected subset of the points of a predetermined lattice, said lattice being equal to the union of N cosets of a lattice D_n, $N \geq 1$, D_n being comprised of those n-dimensional, integer-valued-coordinate points which have a predetermined parity, the j^{th} of said cosets being equal to D_nY+u_j, where Y is a predetermined n-by-n orthogonal matrix and u_j is a predetermined n-dimensional vector,

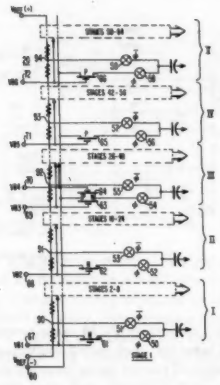
means for generating for each value of j the two n-dimensional integer-valued-coordinate points which are closest and second closest, respectively, to the point $X_j=(X_i-u_j)Y^{-1}$, Y^{-1} being the inverse of the matrix Y, and

means for identifying for each value of j a codeword decision candidate equal to (h_jY+u_j), h_j being the one of said two points which has said predetermined parity, and for providing to an output a signal representing the codeword decision candidate which is closest in n-space to X_i.

4,507,649
FLASH A/D CONVERTER HAVING REDUCED INPUT LOADING

Andrew G. F. Dingwall, Bridgewater, and Victor Zazzu, Montvale, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,732
Int. Cl.[3] H03K *13/02, 13/175*
U.S. Cl. 340—347 AD 6 Claims



1. In a flash analog-to-digital converter for digitizing a range of applied input signals including a plurality of comparators, each comparator having a respective input terminal, a plurality of capacitors one of which is serially connected to the input terminal of each comparator, a signal input terminal for applying input signals and a source of a plurality of reference voltages incrementally ascending in value, sets of switch means for alternately serially coupling respective ones of said plurality of reference voltages or said signal input terminal to respective ones of said plurality of capacitors, means for limiting the maximum potential excursion in ones of said capacitors and thereby reducing loading of said source of reference potentials, said means comprising:

a plurality of N-type FET's each having respective drain, source and gate electrodes, respective ones of said N-type FET's having their drain and source electrodes serially coupled between said input terminal and respective ones of said capacitors which are alternately coupled to respective ones of said reference voltages which are in a relatively negative range of said ascending reference voltages;

a plurality of P-type FET's each having respective drain, source and gate electrodes, respective ones of said P-type FET's having their drain and source electrodes serially coupled between said input terminal and respective ones of said capacitors which are alternately coupled to respective ones of said reference voltages which are in a relatively positive range of said ascending reference voltages;

means for applying D.C. bias potential to the gate electrodes of said N-type FET's, said bias potential conditioning respective ones of the N-type FET's to limit the maximum potential which can be coupled from said input terminal to respective ones of said capacitors, and

means for applying D.C. bias potential to the gate electrodes of said P-type FET's for conditioning respective ones of the P-type FET's to limit the minimum potential which can be coupled from said input terminal to respective ones of said capacitors, said N-type and P-type FET's operating in the source follower mode over respective portions of said range of applied input signals to reduce the loading of said source.

4,507,650

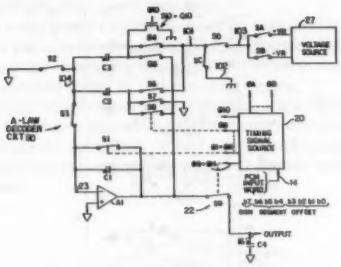
CHARGE REDISTRIBUTION A-LAW PCM DECODER

Christopher W. Kapral, Belmont, Calif., assignor to GTE Communications Products Corporation, Phoenix, Ariz.

Continuation-in-part of Ser. No. 558,567, Dec. 5, 1983, Pat. No. 4,468,654, which is a continuation-in-part of Ser. No. 307,821, Oct. 2, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,410

Int. Cl.[3] **H03K** *13/02*

U.S. Cl. 340—347 DA **17 Claims**



1. Apparatus for converting PCM code words into associated analog signal samples, each word including first, second and third code groups of one or more binary bits which define the polarity, prescribed segment, and step offset within the prescribed segment for an associated analog signal sample, said apparatus comprising:

first, second and third capacitor means each having one and other sides thereof and each having the same value of capacitance;

first means for impressing a prescribed reference voltage and ground on first and second bus lines, respectively; p1 differential input operational amplifier means having a non-inverting input electrically connected to ground for impressing a virtual ground potential on an inverting input terminal thereof, said inverting input terminal and an output terminal thereof being connected to said one and other sides of said first capacitor means; and

first switch means responsive to the second and third code groups (a) for cyclically connecting one and other sides of said second capacitor means to ground and to one of ground and said reference voltage, respectively, for discharging said second capacitor means and charging it with the reference voltage in accordance with the level of a bit in said third code group, and then connecting one and other sides of said second capacitor means to associated sides of said first capacitor means for redistributing charge thereon a number of times corresponding to the number of bits in said third code group defining the step offset in the prescribed segment; (b) for discharging said first capacitor means; (c) for storing charge on said second capacitor means; (d) for connecting one and other sides of said third capacitor means to ground and to said reference voltage for charging said third capacitor means, and then connecting said other and one sides of said third capacitor means to ground and said one side of said first capacitor means for transferring all charge on said third capacitor means to said first capacitor means for only a first segment which is not the prescribed segment; (e) for cyclically connecting one and other sides of said third capacitor means to ground and to said reference voltage for charging said third capacitor means, and then connecting opposite sides of said third capacitor means to associated sides of said first capacitor means for redistributing charge on them a first prescribed number of times (which may be zero) associated with the prescribed segment which is designated by the second code group; (f) for connecting one and other sides of said second capacitor means to said one side of said first capacitor means and ground, respectively, for transferring all charge on said second capacitor means to said first capacitor means for a prescribed segment which is other than the first segment; and (g) for cyclically connecting opposite sides of said third capacitor means to ground for discharging it and then connecting them to associated sides of said first capacitor means for redistributing charge on them a number of times corresponding to segments that are above the prescribed segment which is specified by the second code group.

4,507,651

CONTACT-FREE PUSH-BUTTON KEY FOR GENERATING AN ELECTRICAL SIGNAL UPON DEPRESSION THEREOF

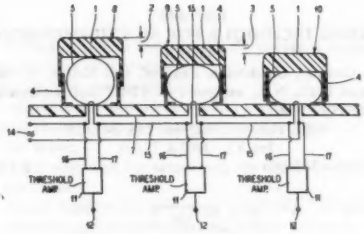
Richard Boll, Muehlheim, and Michael Friedrichs, Hanau, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,021

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127053

Int. Cl.[3] **G08C** *9/00*

U.S. Cl. 340—365 L **13 Claims**



1. A depressible key for generating an electric signal identifying whether the key is in a depressed or non-depressed state comprising:

a deformable continuous toroidal tape core;

a means for applying pressure for deforming said core;

at least one electrically conductive winding extending through said core in which winding said electric signal is generated upon deformation of said core; and

a means for limiting deformation of said core such that after an initial deformation said core presses against said limiting means and requires a discontinuous change in said pressure for further deformation of said core.

4,507,652

BIDIRECTIONAL, INTERACTIVE FIRE DETECTION SYSTEM

William R. Vogt, Rockaway, and John M. Wynne, Oak Ridge, both of N.J., assignors to Baker Industries, Inc., Parsippany, N.J.

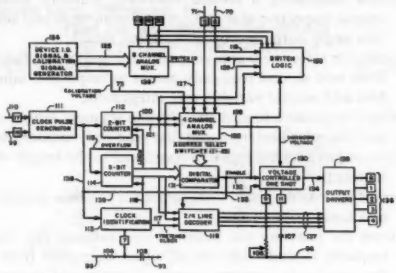
Division of Ser. No. 345,909, Feb. 4, 1982, Pat. No. 4,470,047. This application Mar. 15, 1984, Ser. No. 589,792

Int. Cl.[3] **H04Q** *9/00*; **G08B** *29/00*

U.S. Cl. 340—501 **19 Claims**

1. A fire detection system comprising a pair of electrical conductors, a controller connected to transmit data over the electrical conductors, a plurality of transponders coupled to said conductors, at least one of said transponders having means for returning other data to the controller, and a transducer coupled to the transponder returning data, which transponder includes means for returning said data as a function of the transducer response, and in which the controller includes means for storing a first data signal denoting transducer response data from the transponder, a subsequent data signal

provides later transducer response information, and means is connected to compare the subsequent data signal against the



first data signal, to provide a transducer compensation signal for use in the system.

4,507,653

ELECTRONIC SOUND DETECTING UNIT FOR LOCATING MISSING ARTICLES

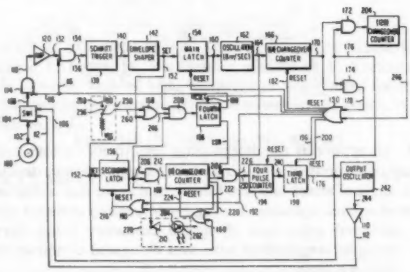
Edward B. Bayer, P.O. Box 7738, Johannesburg, South Africa

Filed Jun. 28, 1984, Ser. No. 625,820

Claims priority, application South Africa, Jun. 29, 1983, 83/4738; Jul. 26, 1983, 83/5445

Int. Cl.³ G08B *1/08;* G10K *11/00*

U.S. Cl. 340—539 **28 Claims**



1. Apparatus, which comprises:

a miniature battery-powered electronic unit adapted to be attached to a common article such as keys or eyeglasses and including means responsive to a plurality of human-generated sounds for emitting audible tones to enable the common article to be located, said means comprising:

(a) transducer means responsive to said sounds for generating first signals;

(b) signal processing means, connected to said transducer means, for providing a binary pulse when each of said first signals exceeds a preselected threshold level; and

(c) detector means, connected to said signal processing means, for producing an output signal when a plurality of said binary pulses is received by said detector means within a first predetermined time period.

4,507,654

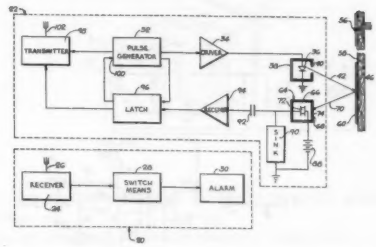
SECURITY SYSTEM WITH INFRARED OPTICAL POSITION DETECTOR

Larry G. Stolarczyk, and John R. Owerko, both of Raton, N. Mex., assignors to A. R. F. Products, Raton, N. Mex.

Filed Oct. 30, 1981, Ser. No. 316,868

Int. Cl.³ G08B *13/08*

U.S. Cl. 340—545 **8 Claims**



1. A security system responsive to the position of an access gate disposed in an opening in a wall of a building structure, said access gate being movably attached to the wall to assume an open or a closed position, comprising a means for indicating an occurrence, a control unit connected to the means for indicating an occurrence, the means for indicating an occurrence being responsive to an electrical signal from the control unit, and detection means operatively associated with the control unit, said detection means comprising a reflector mounted on the access gate and extending normally therefrom, said reflector being disposed in a first position when the access gate is in the closed position and a second position when the access gate is in the open position, a base adapted to be mounted on the wall of the building structure adjacent to the access gate, an electrical pulse generator mounted on the base, an infrared radiation generator mounted on the base and electrically connected to the pulse generator, said infrared generator being responsive to electrical pulses from the pulse generator to produce pulses of infrared radiation, said infrared generator including means for directing said infrared radiation in a beam with a central axis extending from the base to the first position of the reflector, a detector mounted on the base, said detector having an infrared radiation sensitive surface and producing an electrical signal responsive to infrared radiation, said detector having means limiting radiation reaching said infrared sensitive surface to a direction having a central axis extending toward the first position of the reflector, the second position of the reflector being off-axis with respect to the beam of the infrared generator and central axis of the detector, whereby the reflector when located in the first position is in the paths of the beams of the generator and the detector and will scatter infrared radiation from the infrared generator to the detector to produce an electrical signal, and a coincidence circuit electrically connected to the detector and the pulse generator, the control unit being operatively associated with the detector through the coincidence circuit.

4,507,655

MEMORY DEVICE FOR LIGHTING CONTROL PURPOSES

Guy Cosse, 171 bis, Avenue Victor Hugo, 92140 Clamart, and Bernard Serres, 7, rue des Pommaries, 74000 Annecy le Vieux, both of France

Filed May 11, 1982, Ser. No. 377,011

Claims priority, application France, May 14, 1981, 81 09611

Int. Cl.³ G08B *19/00;* G09G *3/00*

U.S. Cl. 340—641 **4 Claims**

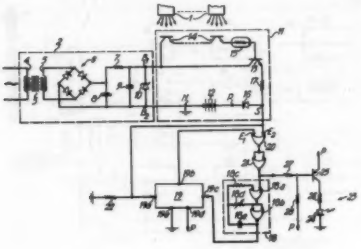
1. A lighting control device comprising:

storage means for storing information concerning operation of at least one lighting means during operation of said

lighting means over at least one time interval, said storage means comprising,

at least one photodetector which receives light from said lighting means during operation of said lighting means, and

electric power accumulator means connected to said at least one photodetector for accumulating charge during operation of said lighting means, wherein the accumulation of



charge by said accumulator means is controlled by said at least one photodetector; and

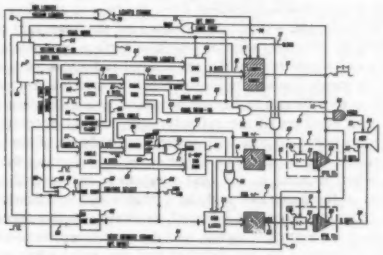
signalling means coupled to said storage means for signalling said information stored in said storage means, said signalling means being activated by a discharge of said accumulator means, said signalling means enabling verification of operation of said lighting means only after operation of said lighting means.

4,507,656

CHARACTER/VECTOR CONTROLLER FOR STROKE WRITTEN CRT DISPLAYS

William A. Morey, Marion, and Ronald J. Tonneson, Fairfax, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 13, 1982, Ser. No. 417,318
Int. Cl.³ G09G 1/10
U.S. Cl. 340—739 **7 Claims**



1. A system for drawing characters on the face of a cathode ray tube by developing respective X and Y deflection signals which collectively define a vector of selected length and polar angle, comprising:

a microprocessor providing a digital addressing output assigned to each of a plurality of characters to be drawn on the face of the cathode ray tube;

a first read-only memory means receiving said microprocessor addressing outputs and outputting a sequence of digital data bytes sequentially definitive of contiguous vectors defining that character, each said vector defining byte being defined by bits definitive of straight-line segment lengths and angles of contiguous vectors defining that character including bits defining the segment angle and a video on-off bit;

means for selectively adding to said bits defining each segment angle of a character, to obtain a summation angle, a character rotation angle outputted from said microprocessor;

means addressing a second read-only memory means to output respective sine and cosine functions of said summation angle outputted by said adding means;

means for selectively applying said sine and cosine functions from said second read-only means as respective inputs to first and second variable rate integrators;

means responsive to said straight-line segment length defining bits outputted from said first read-only memory means to output a timing signal proportional to the length of that segment;

means for enabling said integrators for the time duration of said timing signal; and

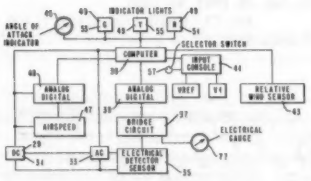
means for enabling the beam of said cathode ray tube in response to said video on-off signal outputted from said first read-only memory means, wherein said integrators directly generate deflection signals.

4,507,657

APPARATUS FOR DETERMINING VARIOUS OPERATIONAL CONDITIONS OF AN AIRCRAFT

Kenneth C. Bates, 28 Scenic Dr., Poughkeepsie, N.Y. 12603

Filed Nov. 7, 1983, Ser. No. 549,159
Int. Cl.³ G08G 5/00
U.S. Cl. 340—959 **12 Claims**



1. An apparatus for determining selectively various operational conditions of an aircraft such as acceleration, deceleration, angle of attack and wind shear, said apparatus comprising:

an elongated container having a substantially constant cross-sectional area, said elongated container being curved along its longitudinal axis, said elongated container containing a fluid;

a block means located within said elongated container and immersed within the fluid contained within the elongated container, the density of the block means being greater than the density of the fluid contained within the elongated container, said block means having substantially the same cross-sectional shape and area as the elongated container and adapted to slide within said elongated container;

an electrical detecting means located about the elongated container between the centerpoint and the end of the elongated container for determining the location of the block means within the elongated container and for supplying an electrical signal to indicate such locate; and

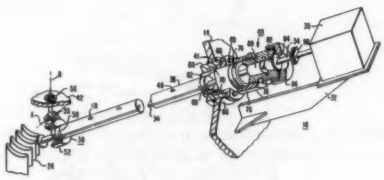
an electrical evaluation and indicating means electrically connected to the electrical detecting means and including a selector means to determine which operational condition to evaluate.

4,507,658

NARROW BEAM RADAR INSTALLATION FOR TURBINE MONITORING

John E. Keating, Upper Derby, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1982, Ser. No. 403,432
Int. Cl.³ G01S 13/08; G01H 3/04
U.S. Cl. 343—12 R 10 Claims



1. A narrow beam radar installation for monitoring the blades of a turbine having an outer casing, comprising:

(A) a narrow beam radar unit positioned outside of said outer casing;

(B) a relatively rigid elongated waveguide support member positioned within said turbine;

(C) a waveguide connected to said radar unit for conduction of transmitted and reflected radar signals and positioned within said rigid support member;

(D) said waveguide extending through an aperture in said outer casing to a point adjacent said blades to be monitored;

(E) first means for supporting said waveguide support member at a position within said turbine;

(F) second means for supporting said waveguide support member in the vicinity of said aperture; and

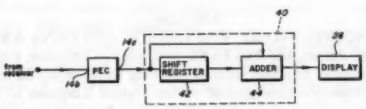
(G) means for sealing said aperture around said waveguide.

4,507,659

PULSE COMPRESSION SIDELOBE SUPPRESSOR

Bernard L. Lewis, Ft. Washington, and Frank F. Kretschmer, Jr., Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1983, Ser. No. 506,945
Int. Cl.³ G01S 7/30
U.S. Cl. 343—17.2 PC 1 Claim



1. A pulse compression radar system comprising:

a symmetrical frequency derived phase coded pulse expander-compressor for providing an expanded pulse for compressing the target echos of said expanded pulse received by said radar system into a compressed pulse output signal; said pulse expander-compressor utilizing a phase code selected from the group consisting of the symmetrical P1, P2, and P4 codes; and

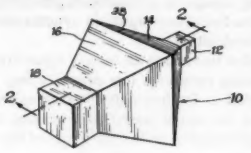
a sliding-window two sample adder, interconnected with said pulse expander compressor for receiving said compressed pulse output signal and for reducing the amplitude of the range-time sidelobes of said compressed pulse output signal.

4,507,660

ANECHOIC CHAMBER

Leland H. Hemming, Poway, Calif., assignor to Advanced Electromagnetics, Inc., Santee, Calif.

Filed Jul. 16, 1982, Ser. No. 398,746
Int. Cl.³ H01Q 17/00
U.S. Cl. 343—18 A 6 Claims



1. An anechoic chamber for electromagnetic waves comprising:

(a) an elongated enclosure interiorly lined with electromagnetic wave absorber material;

(b) said enclosure defining a source region at one end and a receiver region at the other end, and a longitudinal axis running generally between said regions;

(c) said enclosure defining an expanded central region which tapers inwardly running in opposite directions along said axis from said central region toward said source and receiver region, respectively;

(d) said expanded central region being defined by a pair of mutually facing and aligned flared horns joined around their rims;

(e) the portions of said enclosure defining said source region and said receiver region being generally box-shaped and open into the smaller ends of their respective horns; and

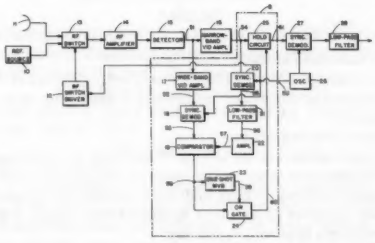
(f) wherein each of said horns is substantially defined by four planes at least two of which flare out from said planes comprising top and bottom plane horizontal in their transverse dimension and side planes vertical in their transverse dimension.

4,507,661

INTERFERING NOISE PULSE ELIMINATOR AND ITS USE IN A DICKE TYPE RADIOMETER CIRCUIT

Mervyn C. Hoover, Jr., and Bruce M. Heydlauff, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1982, Ser. No. 371,706
Int. Cl.³ G01S 13/86; H04B 1/10
U.S. Cl. 343—351 2 Claims



1. An apparatus for automatically removing interfering noise pulses from a modulated video-frequency signal in a Dicke type circuit comprising:

means coupled to receive the modulated video-frequency signal for wideband-amplifying it;

means connected to simultaneously receive the same modu-

lated video-frequency signal received by the wideband-amplifying means for narrowband-amplifying it;

first means coupled to receive the wideband-amplifying means output for demodulating the amplified, modulated video-frequency signal in synchronization with its original modulation;

second means coupled to an output of the narrowband-amplifying means for demodulating the amplified, modulated video-frequency signal in synchronization with its original modulation;

means coupled to receive an output signal from the second demodulating means for low-pass filtering;

means coupled to the low-pass filtering means for general-amplifying its output signal to a voltage level approximately equivalent to an output signal of the first demodulating means;

means coupled to receive the output signal of the first demodulating means and the output signal of the general-amplifying means for comparing them so that an alerting signal is emitted when interfering noise pulses are present;

means coupled to receive the alerting signal for establishing a control pulse extending from the inception to the final effect of each interfering pulse; and

means connected to the establishing means for interrupting each interfering noise pulse and simultaneously holding the modulated video-frequency signal's voltage constant during the period of the control pulse.

4,507,662

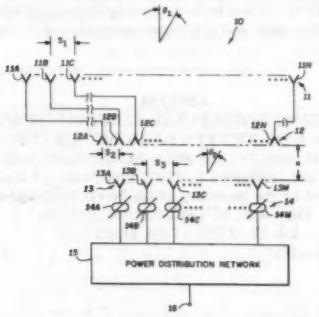
OPTICALLY COUPLED, ARRAY ANTENNA

Carl Rothenberg, North Bellmore; John J. Stangel, Mahopac, and Pasquale A. Valentino, Glen Head, all of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,142

Int. Cl.³ H01Q *3/26, 19/06;* H04B *7/00*

U.S. Cl. 343—376 **13 Claims**



1. A scannable antenna comprising:

a first antenna array having elements with spacings s_1 therebetween in an energy exchanging relationship with free space;

a space coupling region;

a second antenna array having N elements with spacings s_2 therebetween in an energy coupling relationship with said space coupling region and correspondingly coupled to said elements of said first antenna array, said s_2 spacing being less than said s_1 spacing;

a third antenna array having M elements with spacings s_3 therebetween in an energy coupling relationship with said space coupling region, said s_3 spacing being greater than said s_2 spacing and N being greater than M; and

means coupled to said third antenna array for establishing a preselected phase and amplitude distribution across said elements of said third array.

4,507,663

AUTOMATIC DIRECTION FINDER

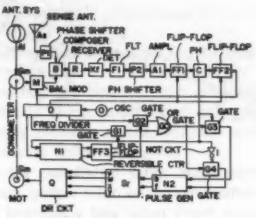
Kenzo Mori, Tokyo, and Mikio Ozawa, Yokohama, both of Japan, assignors to Taiyo Musen Co. Ltd., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,925

Claims priority, application Japan, Aug. 18, 1981, 56-128186

Int. Cl.³ G01S *5/04*

U.S. Cl. 343—440 **2 Claims**



1. An automatic direction finder comprising:

a directive antenna system;

a non-directive antenna system;

a stepping motor for rotating the directivity of said directive antenna system;

a receiving circuit for receiving a signal from a balanced modulator, said signal having been prepared by the balancing and modulating of one of the outputs of said directive antenna system and a non-directive antenna by means of a low-frequency signal and by composing the said balanced and modulated output and the other output, for demodulating said low-frequency signal;

a phase-detecting circuit for comparing the polarities of the antinodes of the output signal of said receiving circuit to detect the polarities of the phase of said output signal;

a reversible counter for adding or subtracting clock pulses in accordance with the output signal of said phase-detecting circuit; and

a motor-driving circuit for rotating said stepping motor a predetermined angle clockwise or counter-clockwise in accordance with the added or subtracted pulses of said reversible counter.

4,507,664

DIELECTRIC IMAGE WAVEGUIDE ANTENNA ARRAY

James R. James, and Ann Henderson, both of Swindon, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Nortiaern Ireland, London, England

Filed Jun. 16, 1982, Ser. No. 389,069

Claims priority, application United Kingdom, Jun. 16, 1981, 8118509; Jul. 10, 1981, 8121408

Int. Cl.³ H01Q *1/38*

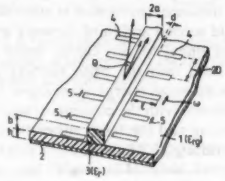
U.S. Cl. 343—700 MS **11 Claims**

1. An antenna array comprising:

a dielectric image waveguide system comprising a conducting ground-plane, a planar dielectric sheet backed by said ground-plane, and a longitudinally extending dielectric feeder-guide of greater thickness than the sheet, said feeder-guide having a substantially different relative permittivity from that of the sheet and being in surface-to-surface contact with the sheet; and

a plurality of conducting-sheet strips on a same surface of said dielectric sheet as said feeder-guide and spaced along

and extending outwards from said feeder-guide, said strips being electrically insulated from said ground plane, the inner ends of the strips being located relative to the feeder-



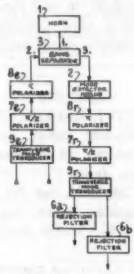
guide so as to effect electromagnetic coupling therewith, and their outer ends serving, in use, to radiate or receive most of the power.

4,507,665

PRIMARY SOURCE WITH FREQUENCY RE-UTILIZATION

Nhu Bui-Hai, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 9, 1982, Ser. No. 386,600
Claims priority, application France, Jun. 11, 1981, 81 11481
Int. Cl.³ H01Q *13/00*
U.S. Cl. 343—786 **4 Claims**



1. A primary source with frequency re-utilization operating in a very wide band, comprising:

a horn having a neck, an opening and two types of evenly spaces alternate corrugations whose depth decreases, for each of the types, from the neck towards the opening,

a band separator of the quasi-optical filter type having a first access coupled to the horn and a second and third accesses,

a mode extractor means having an input coupled to the third access of the band separator and an output,

a first and second transverse mode transducer each having a first, a second and a third access and which are respectively coupled, by their first access, to the second access of the band separator and to the output of the mode extractor means,

two rejection filters coupled respectively to the second and third accesses of the second transducer,

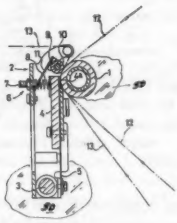
and a first "$\pi/2$" polarizing device coupled in series between the horn and the first transducer and a second "$\pi/2$" polarizing device coupled in series between the horn and the second transducer.

4,507,666

THERMAL HEAD SUPPORTING MECHANISM

Kouichi Kondo, and Tadashi Tamura, both of Hanamaki, Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jun. 24, 1982, Ser. No. 391,299
Claims priority, application Japan, Jul. 15, 1981, 56-103785[U]
Int. Cl.³ G01D *15/10, 15/16;* **B41J** *3/20*
U.S. Cl. 346—76 PH **24 Claims**



1. A thermal head supporting mechanism for a thermal printer, wherein the printer comprises a platen supported in position on a body and a platen is for supporting a printing medium as the printing medium is being contacted by a thermal head; the platen extending along a direction;

a thermal head supported on the body and being adapted to be brought into and out of contact with the printing medium supported on the platen;

the thermal head supporting mechanism comprising:

a head frame for supporting the thermal head, the head frame being movable to move the thermal head to contact the printing medium supported on the platen;

elastic means on the head frame for elastically supporting the thermal head for permitting the tilt orientation of the thermal head to be adjusted with respect to the direction of the extension of the platen for enabling the thermal head to be tilted parallel to the platen;

adjusting means on the head frame for adjusting the tilt orientation of the thermal head with respect to the platen for adjusting the contact pressure of the thermal head against a printing medium supported on the platen;

the thermal head supporting mechanism also comprising control means attached to the body of the printer for selectively holding the head frame in a closed position to urge the thermal head to press against the printing medium supported on the platen and for selectively holding the head frame in an open position at which the thermal head is apart from the platen.

4,507,667

THERMAL TRANSFER RECORDING APPARATUS

Kiyoshi Tsuboi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 10, 1983, Ser. No. 493,274
Claims priority, application Japan, May 11, 1982, 57-77514; May 11, 1982, 57-77515
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **8 Claims**

1. A thermal transfer recording apparatus comprising:

(a) an ink carrier including an ink layer capable of exhibiting a predetermined characteristic upon being heated;

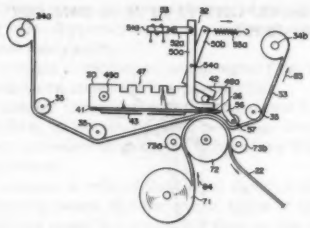
(b) a thermal head in which a plurality of heating elements are arranged which are adapted to be urged against a surface of said ink carrier on which said ink layer is not coated;

(c) first feeding means for, in order to transfer said ink layer onto a recording medium by heat from said heating elements of said thermal head, feeding said ink carrier and said recording medium in the same direction by urging

said heating elements, said ink carrier and said recording medium upon each other;

(d) means for releasing urging force acting among said heating elements, said ink carrier and said recording medium;

(e) second feeding means for feeding said ink carrier independently of said recording medium; and



(f) control means, connected to said releasing means and said second feeding means, for controlling said second feeding means so that the urging force acting among said heating elements, said ink carrier and said recording medium is released so as to keep said ink carrier taut, thereby feeding said ink carrier independently of said recording medium.

4,507,668

THERMAL PRINTER

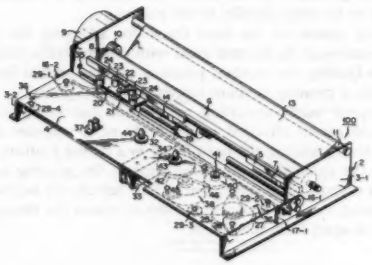
Keiichi Horiya, Numazu; Tsugio Shiozaki, Susono, and Koichiro Sato, Mishima, all of Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,344

Claims priority, application Japan, Oct. 4, 1982, 57-174245; Oct. 18, 1982, 57-182292; Oct. 27, 1982, 57-189924

Int. Cl.³ H05B *1/100*

U.S. Cl. 346—76 PH **9 Claims**



1. A thermal printer comprising:

a carrier;

carrier drive means for reciprocally moving said carrier within a predetermined range;

a thermal head which is provided on said carrier and has a plurality of heating elements;

ribbon drive means, provided separately from said carrier, for driving a printing ribbon coated with a thermally melting ink in a predetermined direction, said printing ribbon being stretched to pass through between a recording medium and said thermal head;

print data generation means for generating print data for each line;

memory means having a first memory area for storing the print data from said print data generation means, a second memory area for storing data corresponding to the length of the ribbon necessary to print said print data, and a third memory area for storing the position data representative of the front end position of the unused portion of said ribbon; and

a data processing circuit which applies a first control signal to said ribbon drive means, in accordance with the contents of said second and third memory areas, to feed said ribbon by the distance determined in accordance with the contents of said second and third memory areas; applies a second control signal to said carrier drive means to set said thermal head into the print starting position; and subsequently supplies an energization signal to the thermal head, in accordance with the contents of said first memory area while moving said carrier in either direction, thereby enabling the printing to proceed.

4,507,669

THERMOSENSITIVE RECORDING SHEET

Hiroshi Sakamoto; Yoshihiro Koseki; Takanori Motosugi, and Norihiko Inaba, all of Namazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 461,812

Claims priority, application Japan, Feb. 5, 1982, 57-17071

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—207 **17 Claims**

1. A thermosensitive recording sheet comprising:

a support material;

a primer layer formed on said support material, said primer layer comprising a first filler and a first binder agent;

a thermosensitive coloring layer formed on said primer layer, said thermosensitive coloring layer comprising a colorless or light-colored leuco dye, an acidic material which induces color formation in said leuco dye upon application of heat thereto, and a third binder in an amount in the range of from 3 wt. % to 10 wt. % of the total weight of said thermosensitive coloring layer; and

a protective layer formed on said thermosensitive coloring layer, said protective layer comprising a water-soluble polymeric second binder agent and a second filler.

4,507,670

THERMOSENSITIVE RECORDING MATERIAL

Takanori Motosugi; Hisashi Sakai, both of Numazu, and Kiyotaka Iiyama, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

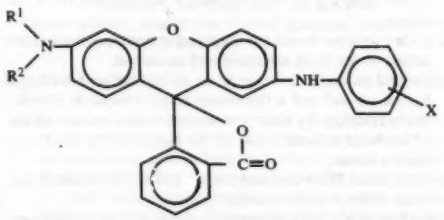
Filed Jan. 24, 1984, Ser. No. 573,432

Claims priority, application Japan, Jan. 25, 1983, 58-10387

Int. Cl.³ B41M *5/00*

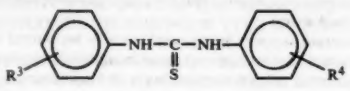
U.S. Cl. 346—208 **12 Claims**

1. A thermosensitive recording material comprising a support material and a thermosensitive recording layer formed thereon, in which thermosensitive coloring layer, colored images are formed by the reaction between a colorless or light-colored leuco dye of the following formula (I) and a color developer of the following formula (II) which is capable of inducing color formation in the leuco dye upon application of heat thereto,



(I)

wherein R^1 and R^2 each indicate a lower alkyl group, and X indicates halogen,



(II)

wherein R^3 and R^4 each indicate hydrogen, halogen, an alkyl group, an acyl group, a halogenated alkyl group or an unsubstituted or substituted aromatic group.

4,507,671

THERMOSENSITIVE RECORDING SHEET

Naomasa Koike, and Shigetoshi Hiraishi, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 588,106

Claims priority, application Japan, Mar. 11, 1983, 58-41222

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—216 **27 Claims**

1. A thermosensitive recording sheet comprising a support and formed thereon a thermosensitive layer containing a usually colorless or light-colored dye precursor and a color developer which is reacted with said dye precursor under heating to develop a color, characterized in that dimethyl 4-hydroxyphthalate is used as said color developer.

4,507,672

METHOD OF FABRICATING A CURRENT CONTROLLED BISTABLE ELECTRICAL ORGANIC THIN FILM SWITCHING DEVICE

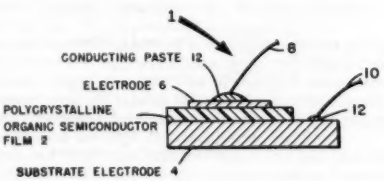
Richard S. Potember; Theodore O. Poehler, both of Baltimore, and Dwaine O. Cowan, Towson, all of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 130,400, Mar. 14, 1980, Pat. No. 4,371,883. This application Jun. 7, 1982, Ser. No. 385,523

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.³ H01L *29/28*

U.S. Cl. 357—8 **17 Claims**



1. A method comprising the steps of: bringing a piece of metal into contact with a neutral acceptor, said contact producing an oxidation-reduction reaction which deposits a film of metal salt on said metal where said metal contacts said neutral acceptor, and said neutral acceptor selected from the group consisting of:

TCNQ(OMe)
TCNQ(OMe)$_2$
TCNQ(OMe)(OEt)
TCNQ(OMe)(O—i—Pr)
TCNQ(OMe)(O—i—Bu)
TCNQ(O—i—C_2H_5)
TCNQ(OEt)(SMe)
TCNQCl
TCNQBr
TCNQClMe
TCNQBrMe
TCNQIMe
TCNQI
TCNQ(OMe)(OCH$_3$)$_2$
TCNQ(CN)$_2$
TCNQ(Me)
TCNQ(Et)
TCNQ(i—Pr)
TCNQ(i—Pr)$_2$
TNAP
TCNE
DDQ: and,

applying an electric field across said film for switching said film from a first impedance state to a second impedance state, said electric field having sufficient energy to induce a solid state reversible electrochemical reaction in said film.

4,507,673

SEMICONDUCTOR MEMORY DEVICE

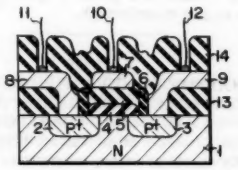
Masaharu Aoyama; Shunichi Hiraki, both of Yokohama, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 194,813, Oct. 7, 1980, abandoned. This application Sep. 21, 1983, Ser. No. 534,361

Claims priority, application Japan, Oct. 13, 1979, 54-132059

Int. Cl.³ H01L *29/78*

U.S. Cl. 357—23 R **5 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate of a first conductivity type;

source and drain regions of a second conductivity type formed in said semiconductor substrate;

a first gate insulation film of silicon dioxide formed on said semiconductor substrate and having a thickness about 50 to 100 Å; and

means for changing the threshold voltage of said memory device between a positive maximum threshold voltage and a negative maximum threshold voltage with a gate voltage of less than ±10 V and for establishing a threshold voltage of zero volts substantially at the center of said positive maximum threshold voltage and said negative maximum threshold voltage, said means comprising a second gate insulation film of silicon carbide formed on said first gate insulation film.

4,507,674

BACKSIDE ILLUMINATED BLOCKED IMPURITY BAND INFRARED DETECTOR

Stephen D. Gaalema, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jun. 7, 1982, Ser. No. 385,979

Int. Cl.³ H01L *27/14*

U.S. Cl. 357—30 **3 Claims**

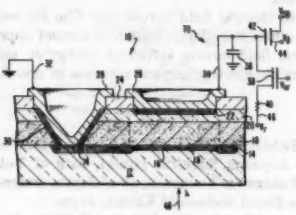
1. A radiation detector comprising:

(a) a first semiconductor layer of a given thickness and impurity concentration appropriate for absorbing radiation in a given frequency range whereupon a proportional number of signal representing charge carriers are generated;

(b) a second semiconductor layer of a given thickness and impurity concentration adjacent said first layer;

(c) first and second contacts adjacent said first and second layers, respectively, and conductively coupled therethrough, the impurity concentration of said second layer

being less than that of said first layer, said second layer being sufficiently thick and having a sufficiently low impurity concentration to substantially prevent the injection of charge carriers from said second contact into said first layer at the energy level of the impurity conduction band of said first layer; and



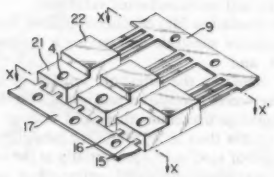
(d) a substrate transparent to radiation within said given frequency range and adjacent a particular one of said first and second contacts, said particular one of said contacts being sufficiently thin to allow substantially all of the radiation within said given frequency range incident thereon to pass therethrough.

4,507,675

METHOD FOR MANUFACTURING A PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND A LEAD FRAME THEREFOR

Hiroyuki Fujii, Osaka; Kenichi Tateno, Shiga, and Mikio Nishikawa, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 25, 1982, Ser. No. 352,119
Claims priority, application Japan, Mar. 5, 1981, 56-32229
Int. Cl.³ H01L *21/56, 23/30, 21/58*
U.S. Cl. 357—70 **3 Claims**



1. In combination, a lead frame and a plastic encapsulated semiconductor device, comprising:

a lead frame comprising:

first and second parallel connecting bands;

a relatively thick substrate support disposed between said connecting bands, said support having opposed upper and lower surfaces;

a plurality of external leads extending from said first connecting band toward said substrate support, at least one of said external leads having an end adjacent said support, another of said external leads being mechanically connected to a first side of said substrate support adjacent said first connecting band;

at least two relatively thin strips disposed substantially parallel to said other of said external leads and mechanically connecting said second connecting band to a second side of said substrate support adjacent said second connecting band and opposite said first side of said substrate support, each of said strips having opposed upper and lower surfaces,

said strips being connected relatively close to the upper surface of said substrate support and relatively remote from the lower surface of said substrate support, so that a step is formed between the lower surface of said substrate support and the adjacent lower surfaces of said strips;

said substrate support being mechanically supported between said first and second connecting bands by means of said other of said external leads and said strips;

a semiconductor element disposed on said substrate support and electrically connected to said external leads; and

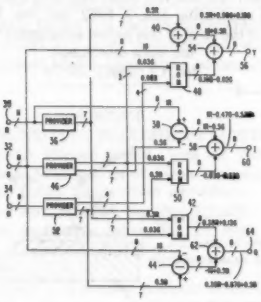
a plastic mass surrounding said substrate support and semiconductor element and adjacent portions of said external leads and said strips, the thickness of said plastic mass below said adjacent portions of said strips being substantially greater than the thickness of said plastic mass below said substrate support, whereby the parts of said strips extending from said plastic mass may be readily severed therefrom.

4,507,676

DIGITAL MATRIXING SYSTEM

Robert A. Dischert, Burlington, and James J. Williams, Jr., Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1982, Ser. No. 437,263
Int. Cl.³ H04N *9/52*
U.S. Cl. 358—30 **9 Claims**



1. Apparatus for digitally multiplying a digital video signal by a constant to produce a desired signal, said apparatus comprising:

dividing means for dividing said digital video signal by powers of two to obtain at least one fraction signal of the type $\frac{1}{2}^n$ of said digital signal, where n is an integer and may include zero;

first summing means coupled to said dividing means for summing together x number of said fraction signals, where x may equal one, to produce an approximate signal approximating said desired signal;

multiplying means coupled to said dividing means for receiving a selected fraction signal therefrom for multiplying said selected fraction signal by a predetermined constant to produce a remainder signal equal to the difference between said desired signal and said approximate signal; and

second summing means coupled to said first summing means and to said multiplying means for summing said remainder and approximate signals to produce said desired signal.

4,507,677

METHOD OF IMPROVING THE RESOLUTION OF THE SEMICONDUCTOR SENSOR TYPE OF TELEVISION CAMERA

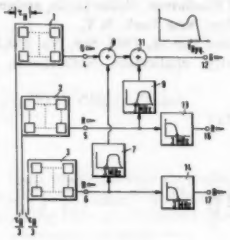
Ulrich Reimers, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,607

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211668

Int. Cl.³ H04N 9/09

U.S. Cl. 358—50 **2 Claims**



1. Method of increasing the resolution of television cameras of the kind using three sets of semiconductor picture sensors having their corresponding picture points relatively offset horizontally, from a point of one set to a point of the next set by 120° in the phase of the picture point scanning period, for each set, comprising the steps of:

utilizing the picture point signals picked up in the camera from a first set of said semiconductor sensors as a reference signal;

separating the picture signals picked up in the camera from a second set of said three sets of semiconductor sensors and likewise the signals picked up from the third set of said semiconductor sensors in each case into a first component having an upper frequency limit below the Nyquist frequency of each set and a second component having a lower frequency limit below the Nyquist frequency of each set;

adding said second component of said signals picked up from said second and third sets of semiconductor sensors to said reference signal for reduction of the first order carrier frequency signals related to the picture point repetition rate of the scanning of said picture point sets, to produce a wide band modified reference signal, and

utilizing said wide band reference signal and said first components of said signals respectively picked up from said second and third sets of sensors for supplying television signals to a utilization or transmission circuit.

4,507,678

AUTOREGISTRATION SYSTEM FOR COLOR TV CAMERAS

Kazuki Iwabe, Kodaira, and Wataru Noguchi, Hachioji, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 409,832

Claims priority, application Japan, Aug. 28, 1981, 56-134274; Feb. 26, 1982, 57-29068; Apr. 1, 1982, 57-52278

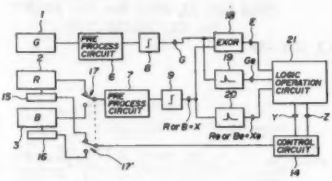
Int. Cl.³ H04N 9/09

U.S. Cl. 358—51 **5 Claims**

1. An autoregistration system for a color television camera equipped with a plurality of image pickup devices so as to combine picture signals obtained through the plurality of channels from the plurality of image pickup devices with respect to an object into a composite color television signal, said system comprises:

means for producing a level difference signal representing a predetermined difference to level between the picture signals of desired two channels, between which a picture image registration is to be carried out, and a first and second edge signals corresponding to each of the picture signals of the two channels; and

a logic circuit for receiving as inputs the difference signal and first and second edge signals and performing thereon an operational processing represented by the following equations so as to obtain the following two kinds of discriminatory signals Y, Z representing the direction of a registration offset between the picture signals of the two channels



$$Y = E \cdot Ge + E \cdot Xe$$

$$Z = E \cdot Xe + E \cdot Ge$$

in which E means the level difference signal and Ge and Xe are respectively the first and second edge signals;

whereby to permit registration of the picture signals without need for any specific registration chart.

4,507,679

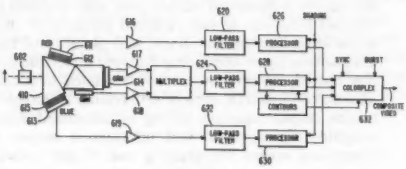
COLOR TV CAMERA WITH FOUR-PORT PRISM

Sidney L. Bendell, Riverton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,211

Int. Cl.³ H04N 9/04

U.S. Cl. 358—55 **6 Claims**



1. An improved television camera arrangement comprising:

a color splitting prism including a light input port and first and second green light output ports

first and second discrete imagers coupled to said first and second output ports of said prism for responding to green light, said first and second imagers being oriented relative to said first and second ports in a manner so as to offset by one-half of one picture element relative to each other the images imaged onto the surfaces of said first and second imagers for providing improved resolution of said green image;

further imaging means responsive to red and blue colors;

focussing means optically coupled to said input port of said color splitting prism for focussing a scene onto the surfaces of said imagers, said focussing means causing the focal points of said blue and red images to differ from each other,

wherein the improvement lies in that

said color splitting prism includes a third output port to which the blue components of said image are coupled, and

a fourth output port to which the red components of said image are coupled; and in that

said further imaging means comprises a third discrete imager coupled to said third output port and a fourth discrete imager coupled to said fourth output port whereby the path lengths to said third and fourth imagers may be adjusted for correcting said focus of said red and blue images.

4,507,680

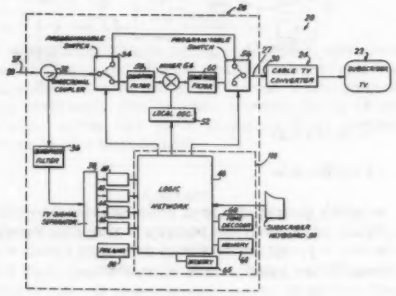
ONE WAY INTERACTIVE MULTISUBSCRIBER COMMUNICATION SYSTEM

Michael J. Freeman, 31 Cornwall La., Sands Point, N.Y. 11050

Filed Jun. 22, 1982, Ser. No. 390,877

Int. Cl.³ H04M 7/10

U.S. Cl. 358—86 **33 Claims**



1. An interactive communication system for providing an interactive information output over a common output channel from a plurality of substantially simultaneously remotely transmitted different information inputs, said system comprising:

an information output means capable of receiving said plurality of remotely transmitted different information inputs and selecting therebetween for selectively providing said interactive information output over said common output channel from one of said received plurality of remotely transmitted information inputs, said plurality of received information inputs containing different selectable information output segments interactively related to a common information message, each of said related selectable information output segments having an associated detectable weighted signal value, said information output means comprising means for selecting one of said information output segments for providing said interactive information output therefrom;

detection means operatively connected to said information output selection means for detecting said associated weighted signal value of said selected information output segment;

accumulation means operatively connected between said detection means and said selection means for retrievably storing and accumulating said associated weighted signal value of said selected information output segments over a predetermined sampling interval for providing a retrievably stored accumulation signal having a value dependent on said accumulated associated weighted signal values during said predetermined sampling interval; and

logic means operatively connected between said selection means, information output means and accumulation means for enabling selection of one of said plurality of selectable related information output segments during an assessment period in response to detection of an enabling signal by said logic means, each of said substantially simultaneously transmitted selectable inputs having an associated selection signal value, said logic means comprising condition responsive means responsive to said accumulation signal value and said enabling signal during said assessment period for providing a selection signal to said selection means dependent on said accumulation signal value, the possible accumulation signal values corresponding to the various available selection signal values; whereby an interactive information output may be automatically provided in accordance with an accumulation of the weighted signal values of prior interactive selections.

4,507,681

METHOD OF AND DEVICE FOR X-RAY PROCESSING

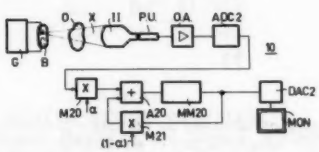
Leonardus A. J. Verhoeven; Otto E. Scheltema, and Walter E. Carels, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1982, Ser. No. 438,832

Claims priority, application Netherlands, Jun. 17, 1982, 8202450

Int. Cl.³ H04N 7/18

U.S. Cl. 358—111 **17 Claims**



1. A method of processing a short series of X-ray images to form a composite image comprising the steps of

making a short series of X-ray images of an object, and

determining a composite image to be displayed from said short series of X-ray images,

said composite image being formed from at least one last X-ray image, said last X-ray image being multiplied by a weighting factor α smaller than or equal to 1, and

said composite image being formed from a previously formed composite image, said previously formed composite image being weighted with a complementary weighting factor $(1-\alpha)$,

wherein said weighting factor α is dependent on the number of X-ray images of said short series of X-ray images previously processed, said weighting factor α having an initial value of 1 and a value smaller than 1 for each new composite image formed, each of said weighting factors being smaller than or equal to a preceding weighting factor.

4,507,682

SELF-GATED AGC DETECTOR

Gopal K. Srivastava, Buffalo Grove, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 12, 1982, Ser. No. 441,124

Int. Cl.³ H04N 5/52

U.S. Cl. 358—178 **7 Claims**

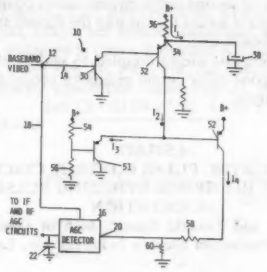
1. In a television receiver developing a video signal, an improved AGC gate signal generating circuit comprising:

a source of supply potential;

a resistor-capacitor circuit coupled to the source of supply potential and characterized by a time constant enabling the development of a capacitor charging current at a relatively slow rate in relation to a horizontal scanning line of the video signal and at a relatively fast rate in relation to a field of the video signal; and

switch means having first and second control inputs coupled for receiving the video signal and the capacitor charge respectively, the switch means being responsive to a nominal level video signal for assuming a non-conductive state during each horizontal scanning line thereof permitting

development of the capacitor charging current and assuming a conductive state during each horizontal sync interval thereof for discharging the capacitor for developing said AGC gate signal, the switch means further assuming



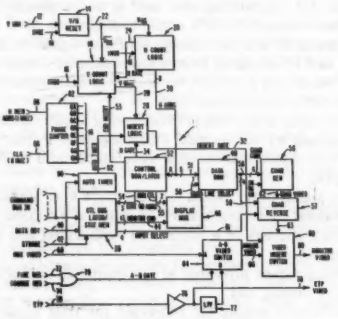
a conductive state for discharging the capacitor for developing said AGC gate signal in response to a number of horizontal scanning lines of a reduced level video signal substantially less than a full field.

4,507,683

CAMERA STATUS AND DIAGNOSTICS DISPLAY SYSTEM

Karl H. Griesshaber, and Charles A. Bialo, both of San Jose, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,739
Int. Cl.³ H04N *7/02, 5/22*
U.S. Cl. 358—185 **24 Claims**



1. System for monitoring via a selected display the status as well as malfunctions of a video camera during a setup mode, comprising:

a monitor for providing a video picture corresponding to the output of the video camera during the setup mode;

insert means operatively coupled to the monitor for generating an insert window anywhere within the video picture while providing horizontal addresses indicative of the display;

means for supplying data indicative of the operation of the camera and of its setup status;

character generating means for storing character data descriptive of the operation of the camera and of its setup status; and

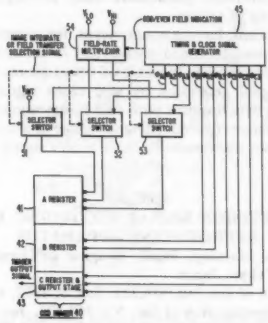
display control means coupled to the means for supplying data and to the character generating means for selectively addressing the character data to generate a character video signal corresponding to the display of the camera operation and status.

4,507,684

REDUCING GRAIN IN MULTI-PHASE-CLOCKED CCD IMAGERS

Donald F. Battson, Landisville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,566
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **10 Claims**



1. A method for biasing during at least selected image integration times the gate electrodes in a CCD imager register to reduce the grain in the CCD imager output signal, said register being of the type with gate electrodes arranged in successive cycles of a first-phase gate electrode followed by a second-phase-gate electrode followed by a third-phase gate electrode, clocked three-phase during image transfer times, said method comprising the steps of during those at least selected image integration times:

applying first bias potential to said second-phase electrodes and applying second bias potential to said third-phase electrodes, one of said first and second bias potentials being of a value for inducing charge carrier collection sites close by the gate electrodes to which it is applied, for collecting charge carriers generated in said register, and the other of said first and second bias potentials being of a value not to induce charge carrier collection sites; and

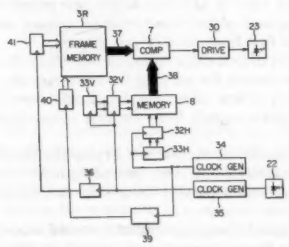
applying to said first-phase electrodes a third bias potential intermediate between said first and second bias potentials, sufficiently offset from said other of said first and second bias potentials to substantially reduce the grain in the CCD imager output signal.

4,507,685

IMAGE RECORDING DEVICE

Naoto Kawamura, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,335
Int. Cl.³ H04N *1/40*
U.S. Cl. 358—283 **12 Claims**



1. An image recording device, comprising:

image signal generating means for generating an image signal representing image data;

means for generating a clock signal;

binary signal generating means for receiving said image signal and for generating a binary signal from the image data represented thereby, said binary signal generating means generating said binary signal as a binary representation of the image data by sequentially utilizing predetermined parameters each corresponding to a plurality of values;

selecting means, having count means, for selectively arranging the predetermined parameters in accordance with a count by said count means, said count means counting the clock signal generated by said clock signal generating means in synchronism with said binary signal; and

recording means for recording an image in accordance with image data represented by said binary signal.

4,507,686

TELEVISION SIGNAL RECORDING AND REPRODUCING APPARATUS

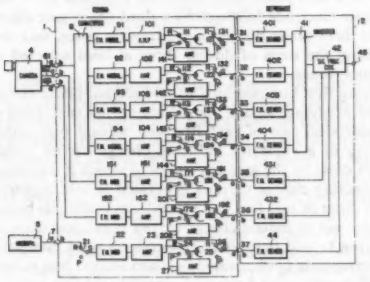
Kenji Kimura, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 416,222, Sep. 9, 1982, abandoned, which is a continuation of Ser. No. 163,404, Jun. 26, 1980, abandoned. This application Feb. 22, 1984, Ser. No. 581,221

Claims priority, application Japan, Jun. 26, 1979, 54-081221

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—310 **3 Claims**



1. A video apparatus, comprising:

(a) a recording unit including:

(1) first connector means for connection to a camera and receiving luminance signals and color signals,

(2) converter means coupled to said first connector means for dividing the luminance signal into a plurality of luminance signal components,

(3) a plurality of first luminance circuit means coupled to said converter for varying each of said luminance signal components,

(4) a plurality of luminance recording head means coupled to respective ones of said first luminance circuit means for recording each of the varied luminance signal components from said first luminance circuit means,

(5) a plurality of first color circuit means coupled to said first connector means for varying the color signals,

(6) a plurality of first color recording head means for recording the varied signals from the first color circuit means, and

(7) second connector means for carrying the signals appears at said luminance and color recording head means, and

(b) a playback unit separable from said recording unit and including:

(1) third connector means coupleable to said second connector means for receiving signals at said second connector means;

(2) a plurality of second luminance circuit means coupled to said third connector means for operating on luminance signals at said luminance recording heads,

(3) an inverter coupled to said plurality of second luminance circuit means for combining the signals from said second luminance circuit means,

(4) a plurality of second color circuit means coupled to said third connector means for varying the signals at said color recording heads, and

(5) signal processing means coupled to said inverter means and said second color circuit means for producing a video playback signal.

4,507,687

HORIZONTAL SYNC PULSE CONTROL CIRCUIT FOR VIDEO TAPE RECORDER UTILIZING PULSE CODE MODULATION

Yutaka Hirota, and Takashi Eguchi, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 19, 1982, Ser. No. 409,552

Claims priority, application Japan, Aug. 28, 1981, 56-135716

Int. Cl.³ H04N *5/91*

U.S. Cl. 358—335 **10 Claims**

FIG. 3A	FIG. 3B	FIG. 3C

1. A horizontal sync pulses control circuit for a video tape recorder for modulating and analog audio signal to a pulse code modulation("PCM") signal conforming to a television signal standard, and recording said PCM signal on and reproducing said PCM signal from a video tape by means of a head of said video tape recorder, wherein said horizontal sync pulse control circuit comprises:

a data signal delay means for delaying a data signal which is obtained by slicing said PCM signal at a first level and which consists of a data sync signal and a PCM data signal;

a sync signal delay means for delaying a sync signal which is obtained by slicing said PCM signal at a second level and which consists of a horizontal sync signal and a vertical sync signal;

a muting means provided at the output of said sync signal delay means; and

a verification means for receiving the data signal and the sync signal in said PCM signal and verifying that said PCM signal complies with a predetermined format, said verification means comprising:

a detection means for detecting the timing relationship between the horizontal sync signal and the data signal in said PCM signal,

a selective signal transfer means operatively associated with said muting means for transferring the output of said sync signal delay means to the succeeding circuit when (i) the timing relationship between the horizontal sync signal and the data signal in said PCM signal coincides with the predetermined formal and when (ii) said relationship differs from said format by a degree within a predetermined range, and for causing said muting means to block the output of said sync signal delay means when said relationship differs from said formal by a degree in excess in said range, and

a horizontal sync signal generating means for retrieving the horizontal sync signal when the timing relationship between the horizontal sync signal and the data signal in said PCM signal differs from said data format by a

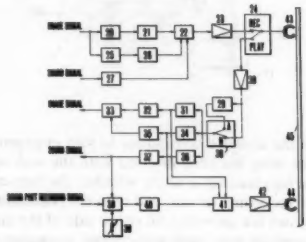
degree within said predetermined range and supplies said retrieved horizontal sync signal to said synce signal delay means.

4,507,688

INFORMATION RECORDING APPARATUS

Makoto Fujiki, Tokyo, and Makoto Takayama, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1982, Ser. No. 348,838
Claims priority, application Japan, Feb. 27, 1981, 56-27757
Int. Cl.³ G11B *27/02, 15/02*
U.S. Cl. 360—13 **19 Claims**



1. A video tape recorder, comprising:
mixing means to obtain mixed signals by mixing image signals and sound signals;
recording means coupled to said mixing means to record said mixed signals on a portion of a tape form recording medium; and
post recording means to make a post recording of sound signals at the portion of the recording medium at which the mixed signals have been recorded;
the tape form recording medium being a magnetic tape and the recording means containing first rotating magnetic head means including at least one magnetic head;
the recording means further including a guide body for contacting and guiding the magnetic tape and transporting means to transport the magnetic tape while the magnetic tape is guided by the guide body, a recording being arranged to be made of the mixed signals over an oblique magnetized locus on the magnetic tape by the first rotating magnetic head;
the post recording means comprising second rotating magnetic head means including at least one magnetic head for post recording on the magnetic tape;
the width of a track formed by the second rotating magnetic head means being narrower than the width of a track formed by the first rotating magnetic head means and wider than the width of said magnetized locus.

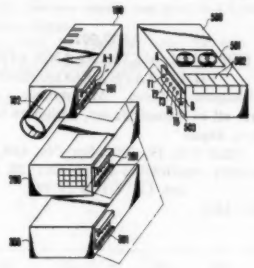
4,507,689

COMPONENT VIDEO SYSTEM AND ARRANGEMENT FOR INTERCONNECTING THE SAME

Susumu Kozuki; Hiroyuki Takimoto, and Masaya Maeda, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,204
Claims priority, application Japan, Jan. 30, 1981, 56-13544
Int. Cl.³ H04N *5/782*
U.S. Cl. 360—33.1 **16 Claims**

1. A video signal recording and reproducing system consisting of a plurality of components, comprising:
(a) a recording and reproducing apparatus comprising recording means for recording input video signals on a recording medium, reproducing means for reproducing the recorded video signals on said recording medium, and a first housing means containing said recording means and reproducing means;
(b) office selecting means for office selecting one of a plurality of transmitted video signals entering from the outside of said system, supplying means for supplying electrical power to said recording and reproducing apparatus, and a second housing means containing said office selecting means and supplying means;
(c) mechanical coupling means for fixedly securing said first and second housings to each other;



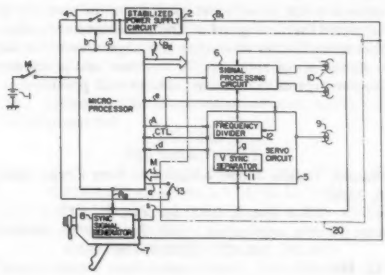
(d) electrical coupling means through which are transferred video signals and electrical power, whereby when said mechanical coupling means are operated, an electrical connection is achieved through said electrical coupling means; and
(e) connecting means for closing a circuit for conducting the electrical power from said supplying means to said recording and reproducing apparatus when coupling is effected by said mechanical and electrical coupling means.

4,507,690

DEVICE FOR CONTROLLING CONSECUTIVE RECORDING OF VIDEO INFORMATION SIGNALS FROM VIDEO CAMERA

Nobuo Azuma; Kenji Satoh, both of Yokohama; Katsuo Mohri, Yokosuka, and Takashi Furuhata, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,104
Claims priority, application Japan, May 29, 1981, 56-81004
Int. Cl.³ H04N *5/78*
U.S. Cl. 360—33.1 **6 Claims**



1. A device for controlling consecutive recording of video information containing signals on a magnetic recording medium in a magnetic recording and reproducing apparatus including a motor for driving head carrying means and a pause switch for setting the apparatus in a pausing operation mode, said video information containing signals being fed to said apparatus with variable time spacing from a video camera including a sync signal generator, comprising:
control switching means, at least parts of said apparatus and

said video camera being connectable with a power source through said control switching means;

means for rendering said control switching means non-conductive in response to actuation of said pause switch and for rendering said control switching means conductive in response to release of said pause switch; and

means for initializing said sync signal generator with a signal produced in synchronism with the rotation of said head carrying means driving motor.

4,507,691

EDITING CONTROL METHOD AND APPARATUS FOR VIDEO TAPE RECORDERS

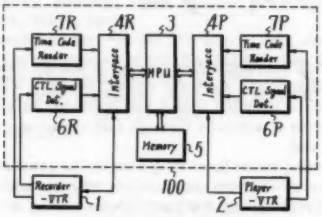
Mamoru Ishiguro; Atsuo Matsuyama, and Kazumasa Yamamura, all of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,250

Claims priority, application Japan, Oct. 20, 1981, 56-167670

Int. Cl.³ G11B *27/00*

U.S. Cl. 360—14.3 **34 Claims**



1. An editing control apparatus for use with first and second video tape recording and/or reproducing apparatuses, each employing a video tape having time code signals and control signals recorded thereon, and which is advanced at a predetermined forward speed for recording and reproducing video signals thereon, comprising:

time code reading means for reading said time code signals on said video tapes;

control signal reading means for reading said control signals on said video tapes; and

controller means for controlling said video tape recording and/or reproducing apparatuses in response to said time code signals and said control signals to position said video tapes at respective preroll points by rewinding said video tapes at a first speed substantially greater than said predetermined forward speed to first predetermined points, and thereafter further rewinding the respective video tapes at a second speed substantially less than said predetermined forward speed to the respective preroll points.

4,507,692

TAPE CASSETTE

Shin Sasaki, Tagajo, Japan, assignor to Sony Corporation, Tokyo, Japan

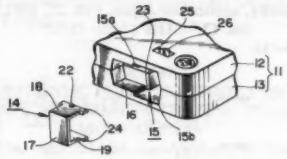
Filed Jun. 2, 1982, Ser. No. 384,237

Claims priority, application Japan, Jun. 4, 1981, 56-82637[U]

Int. Cl.³ G11B *15/04*

U.S. Cl. 360—60 **1 Claim**

1. A tape cassette comprising a cassette formed with an upper half portion and a lower half portion which are integrally connected together, a magnetic tape wound on a pair of mounting reels which are rotatably mounted in the cassette, a mistake erasure inhibiting plug insertable into and engageable with an engagement recess provided in one side face of said cassette, said mistake erasure inhibiting plug having a central web and a pair of insertion legs which extend from the ends of said central web and also has an engagement portion for engaging mating engagement portions provided in said engagement recess, said plug receivable into said engagement recess in either of two selectable positions with the web leading or with the insertion legs leading, said insertion legs sliding along surfaces of the cassette to close said engagement recess, said engagement portions engaging with mating engagement portions in the engagement recess of the cassette and comprising engagement projections mounted on the outer surfaces of said insertion legs at central locations of said mistake erasure inhibiting plug, and means provided for indicating in a window



opening in the cassette contiguous to said engagement recess whether the plug has been inserted with the web side leading or with the legs leading to show whether the tape cassette can be used for recording or not, and wherein positioning or stopper projections are provided on either side of the end portions of said insertion legs, said projections engaging a stepped portion in said engagement recess of the cassette for controlling the amount of insertion of said erasure inhibiting plug into said engagement recess.

4,507,693

CONTROL APPARATUS FOR ROTATION TYPE STORAGE DEVICE

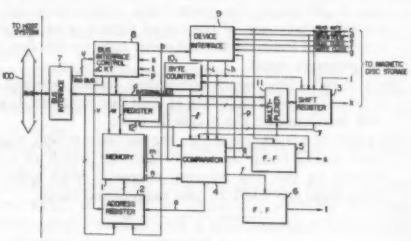
Toshihiko Matsuda, Owariasahi; Morihiko Takashi, Seto, and Mistuo Yoshida, Owariasahi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,648

Claims priority, application Japan, Apr. 20, 1981, 56-60352

Int. Cl.³ G11B *5/012*

U.S. Cl. 360—72.2 **13 Claims**



1. A control apparatus for a rotation type storage device which is divided into a plurality of regions each of which has an address area, serving for recording control information concerning addresses and an indication of the leading part of the region, and a data area serving for recording data, comprising:

(a) memory means for storing control information which includes addresses and indication of the leading part of a region to be accessed;

(b) register means for storing temporarily therein control information read from said address area in a region;

(c) comparison means for comparing said control information read out from said memory means with said control information from said register means; and

(d) control means for controlling said data area to be accessed in accordance with the result of comparison effected by said comparison means.

4,507,694

SELECTION/DRIVE SYSTEM FOR USE IN A TAPE RECORDING/REPRODUCING APPARATUS

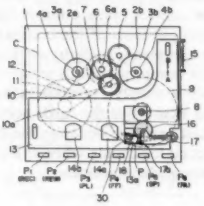
Toshio Hosono; Masayoshi Sakamoto, and Shozo Ema, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,944

Claims priority, application Japan, May 22, 1981, 56-073210[U]

Int. Cl.³ G11B *17/00*

U.S. Cl. 360—90 6 Claims



1. In a magnetic tape recording/reproducing apparatus comprising a chassis, an electric motor fixedly secured on the chassis, a head base mounted for sliding motion on the chassis, a capstan adapted to be rotated by means of the motor, and a pinch roller adapted to be swung into and out of pressure contact with the capstan,

a selection/drive system comprising

a drive gear pivotably mounted on the chassis and adapted to be rotated by means of the motor,

a sector gear pivotably mounted on the chassis, consisting of a toothed segment and a non-toothed segment, and adapted to mesh with said drive gear when the toothed segment faces said drive gear,

means for moving the head base and the pinch roller to positions corresponding to predetermined angles of rotation of said sector gear,

first, second and third engaging means formed on said sector gear,

first, second and third locking members pivoted on the chassis so as to be selectively brought into and out of engagement with any one of said first, second and third engaging means for locking said sector gear at the predetermined angles of rotation where the non-toothed segment faces said drive gear, said first and second locking members being interlocked through resilient means,

biasing means for applying a rotational force to said sector gear in one direction when the non-toothed segment of said sector gear faces said drive gear, said biasing means, when said sector gear is unlocked, causing said sector gear to rotate until it comes in mesh with said drive gear, and

means for selecting one of stop, playback and pause operations for the apparatus, wherein

said first locking member is moved to a position engageable with said first engaging means to lock said sector gear at a first angle of rotation for establishing the stop state, in response to the selection of the stop operation by said selecting means,

said second locking member is moved to a position engageable with said third engaging means to lock said sector gear at a second angle of rotation for establishing the playback state, in response to the selection of the playback operation by said selecting means, and

said third locking member is moved to a position engageable with said third engaging means to lock said sector gear at the first angle of rotation in response to the selection of the pause operation by said selecting means when the apparatus is in the stop state, or is moved to a position engageable with said first engaging means to lock said sector gear at a third angle of rotation, and causes said second locking member to pivot against said resilient means to thereby disengage said second locking member from said second engaging means in response to the selection of the pause operation when the apparatus is in the playback state.

4,507,695

TAPE RECORDER HAVING TRANSIT NOISE PREVENTING MEANS

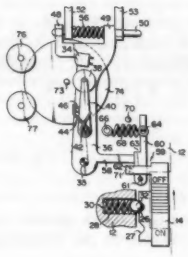
Minoru Kobayashi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 237,939

Claims priority, application Japan, Feb. 29, 1980, 55-24780

Int. Cl.³ G11B *5/54*

U.S. Cl. 360—105 11 Claims



1. In a multi mode tape recorder having a plurality of operating modes, comprising a source of power; a power switch for controlling said source of power, said power switch having at least a power "ON" position; a mode selection member for changing the operation modes of the tape recorder; a movable pinch roller support lever supporting a pinch roller which can contact a tape to drive said tape; and a movable head support lever supporting a magnetic head and movable between an original position where said magnetic head is spaced away from said tape and a second position where said magnetic head is in contact with said tape;

the improvement comprising:

said power switch being separate from said control member and being operable independently of said control member; and

transfer means operatively coupled to said power switch for transferring said head support lever from said original position where said magnetic head is spaced away from said tape to said second position where said magnetic head is in contact with said tape when said power switch is moved to its power "ON" position, said transfer means transferring said head support lever to said second position independently of operation of said mode selection control member.

4,507,696

DRUM-SHAPED SCANNING DEVICE

Heinrich Hütter, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,950

Claims priority, application Austria, May 25, 1981, 2345/81

Int. Cl.³ G11B *5/56, 21/24*

U.S. Cl. 360—109 18 Claims

1. A rotary tape-scanning apparatus comprising:

a drum having a circumferential cylindrical surface coaxial with an axis of rotation,

means for wrapping a portion of a length of tape at least partly around said surface, and transporting the tape past the drum,

at least one magnetic head,

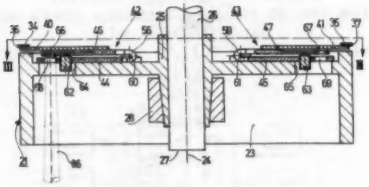
a one-piece head mount for mounting said head to the drum, said head mount comprising

a planar mounting portion for fixing the mount to the drum,

a planar carrier portion for carrying the head, arranged such that said head extends radially outward beyond said cylindrical surface, and

at least one flexible connecting member which functions as an integral hinge and connects the carrier portion to the mounting portion such that the planes of the mounting and carrier portions extend substantially perpendicularly to said axis of rotation, said connecting member being shaped as a strip and extending substantially in a direction parallel to a radial line from said axis through the head, and

an adjusting device including an abutment surface against which a part of the adjusting device bears, said adjusting



device acting on said carrier portion for adjusting the carrier portion relative to the mounting portion in the axial direction,

characterized in that the connecting member is bent into a U-shape about a bending axis which extends parallel to said planes and substantially perpendicular to said radial line,

said connecting member interconnects the mounting and carrier portions at edges remote from the circumferential surface of the drum and said cylindrical surface such that said portions extend radially outward from the connecting member, and

said adjusting device is arranged to act on said carrier portion at a location between said connecting member and the head.

4,507,697

DEVICE FOR INDICATING THE POSITION OF PRINTED CIRCUIT CARDS RELATIVE TO THEIR CONNECTORS

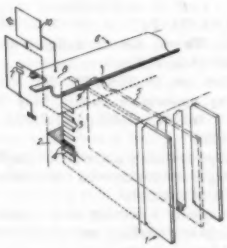
Maurice Ozil, 73, rue des Morillons, 75015 Paris, and Ulrich Finger, 30, rue du Moulin de Pierre, 92140 Clamart, both of France

Filed Mar. 11, 1983, Ser. No. 474,303

Claims priority, application France, Mar. 17, 1982, 82 04528

Int. Cl.³ H02H 7/22

U.S. Cl. 361—1 **10 Claims**



1. A device for indicating the positions of printed circuit cards with respect to electrical connectors, said cards belonging to an operational system in which each of them carries logic components and has a surface of extremity carrying conductor elements able to come into contact with the corresponding conductor elements of an electrical connector, the corresponding conductors of the connector and of the card being able to occupy three relative positions: a first or safe contact position between the corresponding conductor elements of the connector and of the card, the card being correctly positioned relative to its connector, a second intermediate or non-safe contact position between the corresponding conductor elements of the connector and of the card, when the latter is being inserted or removed with respect to its connector, and a third or contact break position between the corresponding conductor elements of the connector and the card, when the card is completely withdrawn from its connector, wherein said device comprises means sensitive to the positions of the cards in order to supply a position indication logic signal having a first logic state when the cards occupy the first position or when at least one card occupies the third position, the signal having a second logic state when at least one card occupies the second intermediate position.

4,507,698

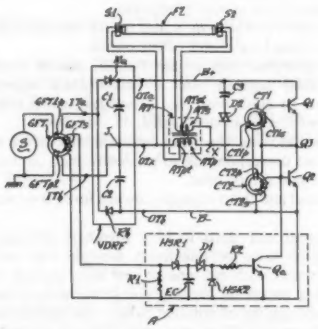
INVERTER-TYPE BALLAST WITH GROUND-FAULT PROTECTION

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Apr. 4, 1983, Ser. No. 481,714

Int. Cl.³ H02H 3/16

U.S. Cl. 361—42 **12 Claims**



5. A ballast for a gas discharge lamp, said ballast adapted to be powered from the relatively low frequency line voltage on an electric utility power line and to power said lamp with a relatively high frequency AC voltage, said line voltage being provided at a set of input terminals and said AC voltage being provided at a set of output terminals, said ballast comprising:

frequency converter means connected in circuit with said input terminals and operative to provide said AC voltage at said output terminals;

connect means operable to connect said lamp with said output terminals;

disable means operable on the receipt of a disable signal to disable said converter means, thereby substantially removing said AC voltage from said output terminals; and

sensor means connected in circuit with said input terminals and operative to provide said disable signal to said disable means whenever there is a flow of relatively high frequency current between the power line and the converter means, said sensor means being non-responsive to the relatively low frequency current flowing therebetweeen in response to said line voltage;

whereby, if there is a flow of relatively high frequency current between said output terminals and the power line, the converter means will be rendered disabled, thereby

substantially removing said AC voltage from said output terminals.

4,507,699

PROTECTIVE DEVICE FOR THE WELDING CIRCUIT OF WELDING POWER SOURCES

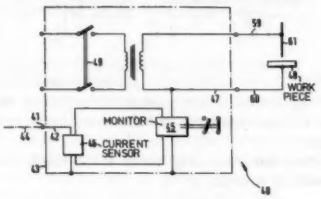
Ernst Röhm, Frankfurt am Main, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,750

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151864

Int. Cl.³ H02H *3/38*

U.S. Cl. 361—50 **4 Claims**



1. A protective device in combination with a welding current source having a welding current circuit,

said welding current circuit comprising an electrode lead, a workpiece lead, and electrode and a workpiece, said circuit being connected to a galvanically separated transformer-primary current circuit connected to a feed network,

the improvement which comprises, said welding current circuit being connected to an enclosure which is connected through a connection means and a lead with a protective wire of the feed network whereby zeroing of said primary circuit is attainable,

means protective of the welding current circuit connected between the workpiece lead and the enclosure comprising a voltage monitor having means for switching off the welding current source,

means connecting the monitor to a current sensor

and said current sensor being connected, on one hand, through said connection means and lead to said protective wire, and on the other, to said enclosure.

4,507,700

PROTECTIVE RELAYING SYSTEM

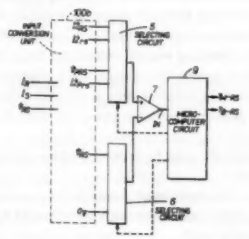
Fumio Andow, Hachiohji; Yuji Okita, Tokyo, and Noriyoshi Suga, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 428,408

Claims priority, application Japan, Sep. 29, 1981, 56-154236

Int. Cl.³ H02H *3/26*

U.S. Cl. 361—80 **26 Claims**



1. A protective relaying system which detects a fault in an electric power system having a circuit breaker by using a current and a voltage of said electric power system and causes said circuit breaker to trip in accordance with the fault detection so as to protect said electric power system, said protective relaying system, comprising:

input conversion means adapted to receive a first input signal corresponding to said current and a second input signal corresponding to said voltage, for converting the magnitude and/or the phase of said first and second input signals to produce a first electrical quantity and a third electrical quantity, and for outputting said second input signal without conversion as a second electrical quantity,

comparing means connected to receive said first, second and third electrical quantities for comparing said first electrical quantity with said second electrical quantity to produce a first logical state signal based on a first comparing result and comparing said third electrical quantity with a fourth electrical quantity to produce a second logical state signal based on a second comparing result cyclically, and for producing a logical state signal including said first and second logical state signals, cyclically; and

digital data processing means connected to receive cyclically said logical state signal, for judging whether a specified logical condition between said first logical state signal and said second logical state signal holds for a predetermined number of times corresponding to a predetermined electrical angle during one cycle of said electric power system and for producing a protection relay output signal based on the judging result, said protection relay output signal being adapted for using to trip said circuit breaker.

4,507,701

LIGHTING ARRESTER WITH LEAKAGE CURRENT DETECTION

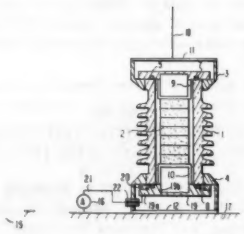
Yukio Fujiwara; Seiji Sonoyama, and Mitsumasa Imataki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,387

Claims priority, application Japan, Jul. 6, 1982, 57-103417

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—127 **8 Claims**



1. A lightning arrester, compising:

(a) a nonlinear resistance (2) mounted within a ceramic casing (1),

(b) a pair of generally annular metal cover rings (3) (4) having upstanding cylindrical side walls, said rings being individually fixed to opposite upper and lower outer end portions of said casing,

(c) a pair of conductive plates (5)(19) having reduced thickness central portions adapted to rupture upon the generation of an abnormal pressure within said ceramic casing, said conductive plates being individually sealingly mounted to opposite upper and lower ends of said ceramic casing within the respective cover rings,

(d) an insulating member (20) mounted between a lower, grounded one of said cover rings (4) and a lower one of said conductive plates (19), and

(e) current detecting means (16) connected between said

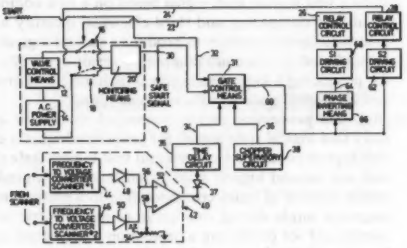
lower conductive plate and ground by conductive means insulated from and passing through said lower cover ring to detect leakage current flowing only through said non-linear resistance.

4,507,702

RELAY CONTROLLED LOAD

Gunter P. Grewe, Mississauga, Canada, assignor to Tervcon Limited, Ontario, Canada

Filed Feb. 25, 1983, Ser. No. 469,995
Claims priority, application Canada, Mar. 9, 1982, 397967
Int. Cl.³ H01H *47/26*; F23N *5/16*
U.S. Cl. 361—161 **7 Claims**



1. A control unit for controlling operation of a load comprising:
a first relay means and a second relay means;
said first and second relay means being connectable in series and oppositely actuable;
said first relay means actuable in response to a first control signal;
said second relay means actuable in response to a second control signal which is inverted with respect to said first control signal whereby the relays are differentially operated;
monitoring means providing an enable signal when said relay means are able to be connected in series, said first and second control signals capable of being generated only when said enable signal is provided by said monitoring means.

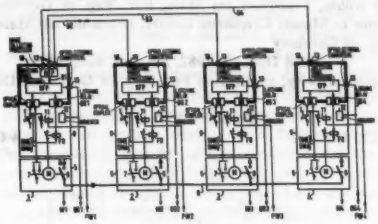
4,507,703

SYSTEM FOR ERROR-PROTECTED OPERATION OF MULTIPANEL, POWER DISTRIBUTION NETWORK SWITCHES

Heinrich Blau, Spardorf; Bernd Görtz, Erlangen; Werner Grohmann, Möhrendorf; Wolfgang Meusel; Herbert Niebergall, both of Erlangen, and Hermann Waldm[illegible] Weiher, all of Fed. Rep. of Germany, assignors to Si[illegible]s Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,352
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1982, 3230404
Int. Cl.³ H01H *47/00*
U.S. Cl. 361—193 **14 Claims**

1. A method of operating a switching facility with protection against switching errors, the switching facility consisting of several switching panels in an electric power distribution network, the method comprising the steps of:
generating a digital image of the operating state of each switching panel utilizing signals from switches within said switching panel;
simulating a requested switching action;
interrogating continuously and sequentially digital images cyclically from individual ones of the switching panels;
transmitting said digital images to a central collecting memory;
assembling said digital images to form an overall image;
transmitting said overall image to each switching panel;
storing said overall image in each switching panel until a subsequent overall image arrives;
requesting a switching action;



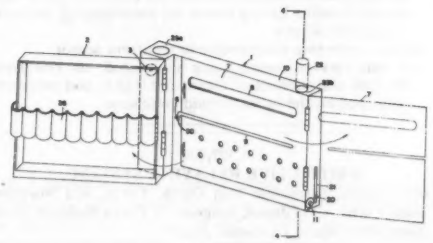
checking for switching error protection interlock conditions in response to information contained in an overall image arriving subsequently and the switching action requested; and
executing said switching action if the result of said step of checking is negative.

4,507,704

CIGARETTE BOX WITH SELF-LIGHTING DEVICE AND LIGHTER

Yung-Ho Chuang, 2nd Fl. No. 38, La. 45, Cheng-Yi S. Rd. Sanchung, Sanchung, Taiwan

Filed Dec. 13, 1983, Ser. No. 560,967
Int. Cl.³ F23Q *7/00*
U.S. Cl. 361—264 **6 Claims**



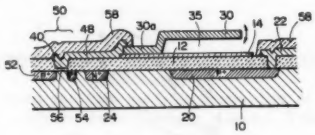
1. A cigarette box with a self-lighting device comprising:
a main box member having a hollow space therein for storing a plurality of cigarettes;
an electrical resistance type cigarette lighter positioned at one end of said hollow space to receive in abutting contacting relationship one end of a cigarette;
an automatic feeding means extending from the other end of said hollow space for urging said cigarettes toward and into contacting relationship with said cigarette lighter;
an electric power source to provide electric power to said lighter;
means to activate said lighter to light a cigarette in contact therewith;
an aperture through said main box member substantially opposite said lighter through which said lighted cigarette is removable; and
a cover pivotally mounted on said main box member for covering said hollow space.

4,507,705

VIBRATION ANALYZING DEVICE

Shigeo Hoshino, Yokosuka; Kazuhiro Takenaka, and Hideo Muro, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 19, 1983, Ser. No. 524,865
Claims priority, application Japan, Aug. 27, 1982, 57-148874
Int. Cl.³ H01G *7/00*
U.S. Cl. 361—283 **28 Claims**



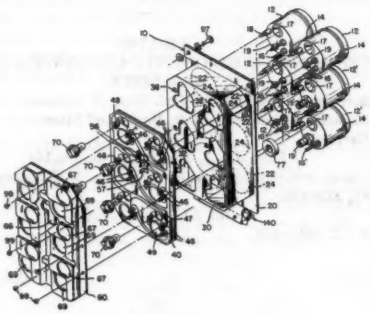
1. A vibration analyzing device comprising:
a semiconductor substrate;
a vibrator having a vibratable portion, which is generally in the form of a thin plate and comprises a unitary electrode layer, and at least one base portion which is contiguous to said vibratable portion and fixed to said substrate such that said vibratable portion is spaced from said substrate and extends generally parallel to said substrate;
a fixed electrode layer formed in a surface region of said substrate so as to lie opposite to said vibratable portion of said vibrator such that said electrode layer of said vibrator and said fixed electrode layer provide a variable capacitor; and
an electric circuit means integrated with said substrate for detecting a change in the capacitance of said variable capacitor.

4,507,706

PLUG-IN INSTRUMENTATION SYSTEM

Ray W. Trexler, Jr., King County, Wash., assignor to Paccar Inc., Bellevue, Wash.

Continuation of Ser. No. 389,872, Jun. 18, 1982, abandoned.
This application Aug. 23, 1984, Ser. No. 644,136
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—331 **4 Claims**



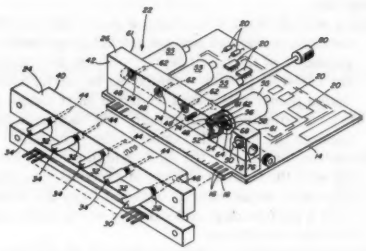
1. An instrumentation system for interchangeably mounting electrical, pressure and vacuum gauges in a vehicle, which comprises:
a plurality of gauges of uniform size and shape, each gauge having a signal terminal projecting rearwardly from the the gauge, the gauges including electrical gauges, each electrical gauge additionally including a ground terminal and a lead terminal projecting rearwardly from locations common to each gauge;
a housing having an instrument panel on the front side thereof and a circuit board on the back side thereof, the panel including a plurality of guage apertures of uniform size and shape corresponding to the uniform size and shape of the gauges and interchangeably receiving individual gauges from the front side of the instrument panel, the circuit board including a plurality of identically positioned terminal connectors adjacent each instrument aperture and positioned correspondingly to the location of the ground terminal and lead terminal of each of the electrical gauges, the circuit board including a plurality of signal terminal apertures open to the rear of the housing, the signal terminal apertures adapted to receive signal connectors remote from the housing through the rear of the housing for connecting signal inputs to the signal terminals of the gauges even though the gauges may be interchangeably located at different locations in the housing;
means for releasably securing the gauges within the housing; and
said circuit board having circuits for electrically coupling common ground terminals and common lead terminals of each electrical gauge mounted within the housing irrespective of the location of a particular guage in one of the guage apertures in the panel.

4,507,707

ELECTRO-PNEUMATIC ASSEMBLY DEVICE

John G. Willis, 5 Rio Grande Dr., Chelmsford, Mass. 01824

Filed Dec. 30, 1981, Ser. No. 336,015
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—380 **3 Claims**



1. An electro-pneumatic assembly device including a rack for receiving mounting boards, a removable mounting board for supporting components inserted in said rack and having a set of electric edge connectors along an edge thereof, an elongated pneumatic manifold split lengthwise into a stationary and a removable fragment, the stationary fragment being affixed to said rack and the removable fragment being affixed to said board, said stationary fragment having a source port for receiving air from a source affixed to said rack and a plurality of requirement ports for delivering controlled air requirements to points on said rack, said stationary and removable fragments having opposed mating interfaces extending along their long dimensions, said stationary fragment having in its mating interface a plurality of requirement orifices each communicating with a corresponding said requirement port of said stationary fragment, and a source orifice communicating with said source port, said removable fragment having orifices in its mating interface corresponding to and opposing the orifices in the mating interface of the stationary fragment, said removable fragment having a delivery channel communicating with said orifice in the removable fragment opposing the source orifice of the stationary fragment, said removable fragment having a plurality of control device ports communicating with said delivery channel and providing means for attachment of and the delivery of source air to a control device, said removable fragment having a receiving port associated with each said device port for receiving controlled air from a control device

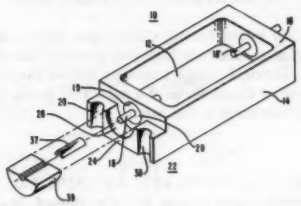
and communicating with an associated orifice in the mating interface of said removable fragment, said assembly device including a seal associated with each pair of opposed orifices effective in completing a channel for passage of air from one opposed orifice to its opposed counterpart.

4,507,708

RF MODULE WITH INTEGRAL COAXIAL CONNECTOR MEANS

Frank A. Lindberg, Relay, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1983, Ser. No. 480,189
Int. Cl.[3] H05K 5/02
U.S. Cl. 361—392 4 Claims



1. An rf module with integral coaxial connector means which can be coupled to a mating rf module, which module comprises;

(a) a module body comprising a planar base portion and a continuous sidewall portion extending upwardly from the perimeter of the base portion, with the terminating end of the sidewall portion adapted to be hermetically sealed with a planar seal means to define an rf circuit package;

(b) a conductive feedthrough pin hermetically sealed through the sidewall portion of the rf module;

(c) means for aligning the feedthrough pin of a first rf module with the feedthrough pin of a second rf module, which alignment means extends outward from the module body with a portion disposed partially about and coaxial with the feedthrough pin;

(d) means for electrically coupling the aligned feedthrough pins for adjacent coupled rf modules;

(e) dielectric insulating means for disposal about the electrically coupled feedthrough pins;

(f) means for clamping the alignment means of the electrically coupled adjacent rf modules together.

4,507,709

ELECTRICAL INTERCONNECT ARRANGEMENT FOR A GFCI MAGNETIC SENSOR MODULE PLUG-IN SUBASSEMBLY

Robert A. Morris; George W. Kiesel, both of Burlington; Paul T. Rajotte, Plainville, and Anthony L. Richards, Southington, all of Conn., assignors to General Electric, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,336
Int. Cl.[3] H05K 1/11
U.S. Cl. 361—400 17 Claims

1. A magnetic sensor plug-in module comprising:

a pair of first and second apertured transformers arranged one over the other;

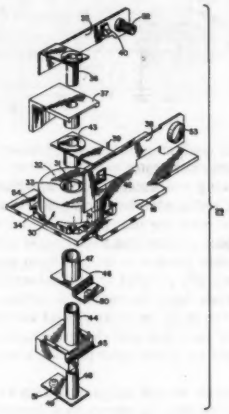
a first conducting strap having first terminal connecting means and first tubular connection means, said first tubular connection means being inserted within said transformer apertures;

a second conducting strap having second terminal means and second tubular connection means, said second tubular connection means being inserted within said first tubular connection means;

first electrically insulative means intermediate said first and second straps providing electrical isolation between said first and second tubular connection means;

first electric contact means having first insertion means inserted within said transformer apertures for electrical connection with said first tubular connection means and having a first fixed electric contact;

second electric contact means having second insertion means inserted within said first insertion means for electrical connection between said second tubular connection means and having a second fixed electric contact; and



second electrically insulative means intermediate said first and second electric contact means providing electrical isolation between said first and second insertion means;

said first conducting strap thereby electrically connecting with said first contact means and said second conducting strap thereby electrically connecting with said second contact means for transferring first and second currents between said first and second terminal connecting means and said first and second fixed electric contacts through said transformer apertures.

4,507,710

ELECTRONIC COMPONENTS AND SYSTEM CARRIER ASSEMBLY

Albert Jung, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,146
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129134
Int. Cl.[3] H05K 7/20
U.S. Cl. 361—428 2 Claims

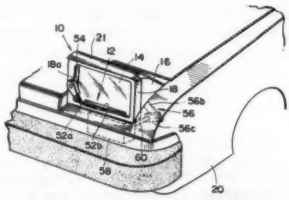
1. In an assembly of electronic components and a system carrier of a SAW-filter having a surrounding injection-molded

housing base of thermoplastic material, active zones of the electronic components and external electric terminals of the system carrier having electrical contacts connected by wires bonded thereto, the improvement therein comprising a web of thermoplastic material permanently secured to the system carrier and disposed between at least one of the contacts of the system carrier, on the one hand, and at least one of the contacts of the electronic components, on the other hand, and insulatingly spacing the bonded wires away from the system carrier.

4,507,711
WIPER-MOUNTED RETRACTABLE HEAD LAMP ASSEMBLY

Eiichi Ono, Zama, and Akio Aoki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 20, 1983, Ser. No. 506,214
Claims priority, application Japan, Jun. 21, 1982, 57-105483
Int. Cl.³ B60Q *1/00, 1/06*
U.S. Cl. 362—61 **9 Claims**



1. In a motor vehicle having a body, a retractable head lamp assembly comprising:

a lamp housing having a lamp contained therein;

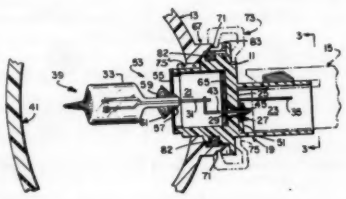
pivoting means for pivotally connecting said lamp housing to the body of the motor vehicle so that the lamp housing is pivotable between a retracted position and an extended position relative to a recess formed in the vehicle body; and

a head lamp wiper assembly for wiping the face of said lamp, said assembly being constructionally independent of said pivoting means so that substantially all parts of said assembly are mounted to said lamp housing to move therewith, whereby the pivoting movement of said lamp housing relative to the vehicle body is freely achieved without being affected by the provision of said wiper assembly.

4,507,712
METHOD OF MAKING REPLACEABLE LAMP UNIT FOR AUTOMOTIVE HEADLIGHT

Richard J. Dolan, R.F.D. #1, Box 279, Bradford, N.H. 03221; Frank Cangiano, Rte. 2, Box 101, Hillsboro, N.H. 03244, and John Van der Linde, R.F.D. #1, Box 6, Deering, N.H.

Filed Jun. 24, 1983, Ser. No. 507,393
Int. Cl.³ F21M *3/30*
U.S. Cl. 362—61 **10 Claims**



1. A method of making a replaceable lamp unit which forms part of an automobile headlight wherein said lamp unit includes an electrically insulative holder, said method comprising:

providing at least two spaced apart, substantially conical-shaped apertures within a wall member of said insulative holder;

positioning a substantially conical-shaped electrically conductive member within each of said apertures;

mechanically connecting each of said conductive members to a respective metallic lug member, said mechanical connecting positively drawing each of said conductive members within said apertures in such a manner so as to seal each of said conductive members within a respective one of said apertures, said mechanical connecting further providing a positive electrical connection between each of said conductive members and a respective one of said metallic lug members;

fixedly securing each of at least two metallic support wires to a respective one of at least two lead-in wires of an electric lamp, said lamp further including an envelope from which said lead-in wires project;

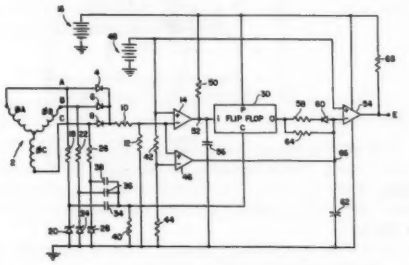
inserting each of said support wires an established distance within a respective one of said electrically conductive members sealed within said apertures of said holder; and

providing an electrical connection between each of said support wires and said conductive members, each of said electric connections between said support wires and said conductive members providing both a hermetic seal between said electrically conductive members and said respective support wire positioned therein and also serving to maintain said electric lamp in a substantially fixed position within said insulative holder.

4,507,713
WIDE FREQUENCY MULTI-PHASE UNDERVOLTAGE DETECTION CIRCUIT

Samuel C. Hsieh, Eatontown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 11, 1983, Ser. No. 540,593
Int. Cl.³ H02H *3/24*
U.S. Cl. 361—92 **4 Claims**



1. A circuit for detecting an undervoltage condition in a multi-phase output from electrical equipment, characterized by:

means for providing a reference voltage;

first comparator means connected to the electrical equipment and to the reference voltage means for comparing the peak level of the multi-phase output to the reference voltage and for providing a comparison output;

means connected to the first comparator means and to the electrical equipment and responsive to the multi-phase output and the comparison output for providing a first output when any of the phase outputs of the multi-phase output are below the reference voltage and for providing a second output when none of the phase outputs are below said reference voltage, said means including switching means having a predetermined threshold and connected to the first comparator means, a clock terminal connected to

the electrical equipment and an output terminal, first capacitor means connected to the input terminal of the switching means and to the first comparator means, and charged by the comparison output to a level above the threshold of the switching means when said output is indicative of any of the phase outputs being below the reference voltage, and the switching means being clocked by any other of the phase outputs for providing the first output at its output terminal; and

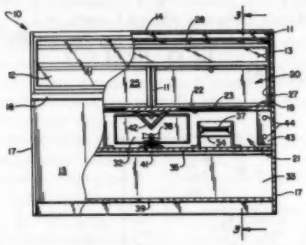
second comparator means connected to the first comparator means and to the electrical equipment, and to the reference voltage means, for comparing the first and second outputs to the reference voltage and for providing a third output indicative of the presence of an undervoltage condition in the three-phase output when the first output is provided, and for providing a fourth output indicative of the absence of the undervoltage condition when the second output is provided.

4,507,714

DISPLAY CASE ADAPTED FOR HIGH LEVEL INCANDESCENT ILLUMINATION

William T. Aschinger, Gahanna; Jack F. Pfeifer, Grove City, and Dale E. Shumaker, Columbus, all of Ohio, assignors to The Columbus Show Case Company, Columbus, Ohio

Filed Mar. 1, 1984, Ser. No. 585,219
Int. Cl.³ F25D *27/00*
U.S. Cl. 362—126 **9 Claims**



1. In an illuminated display case having a plurality of enclosure-forming panels including a generally horizontally disposed deck separating said case into an upper display compartment and a lower utility cabinet, that improvement which comprises:

(a) a front merchandise-viewing window mounted on the display compartment;

(b) a rear merchandise-viewing window mounted on the display compartment in spaced relation to the front window;

(c) a light source mounted in a forward portion of the utility cabinet;

(d) means defining an aperture disposed in a forward portion of the deck in generally vertical alignment with the light source, and means defining an aperture, said front and rear windows and said light source being sized and positioned relative to one another to substantially hide said light source from view through said windows;

(e) a ceiling mirror mounted in the display compartment to receive light in a substantially straight line from the light source; and

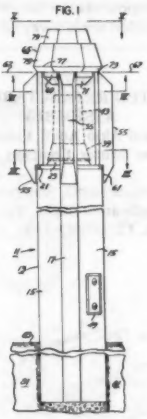
(f) ventilation means disposed in communication with the light source.

4,507,715

POST LIGHT

Paul W. Wedding, Rte. #1, Box 564, Bokeelia, Fla. 33922

Filed Aug. 11, 1983, Ser. No. 522,327
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—153 **9 Claims**



1. A post light comprising an upstanding elongate main body portion of decorative appearance having a bottom end attached to the ground and a top end, said elongate main body portion having a hollow interior, a substantially weather impervious tubular conduit extending lengthwise of said main body portion and lining the hollow interior thereof, and tubular conduit extending at least to the top end of said main body portion, an annular member attached on top of said tubular conduit, a light bulb socket mounted on top of said annular member, sealing means disposed between said light bulb socket and said annular member, an electrical junction box affixed to said main body portion, electrical wires disposed within said tubular conduit and through said annular member for connecting said light bulb socket to said junction box, a light fixture removably mounted on top of said main body portion and surrounding said light bulb socket, a plurality of spaced apart support members disposed around said light fixture and having each a base attached to the top of said main body portion, said support members upwardly extending from the top of said main body portion to beyond the top of said light fixture, said support members being of decorative appearance and forming openings therebetween uncovering said light fixture, and a decorative finial removably disposed on top of said support members above said light fixture.

4,507,716

TOUCH SWITCHABLE LAMP

Ralph H. Benedict, Jr., Philadelphia, Pa., assignor to Touch-On, Inc., Philadelphia, Pa.

Filed Apr. 5, 1983, Ser. No. 482,196
Int. Cl.³ F21V *23/00*
U.S. Cl. 362—295 **6 Claims**

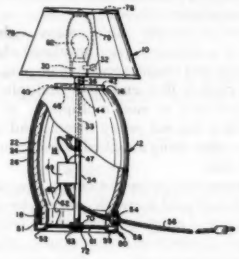
1. A lamp touch switchable by human body proximity or contact over the whole base comprising:

(a) a base having non-conductive parts with a conductive coating substantially covering the base over the non-conductive parts;

(b) a light bulb receptacle for a light bulb supported relative to the base;

(c) switch means having a touch responsive control terminal supported relative to the base for switching the mode of operation of the light bulb between at least a first and second mode of operation; and

(d) conductive means for electrically connecting the light bulb receptacle in circuit with a power source through the switch means and for connecting the control terminal of the switch means to the conducting coating of the non-



conductive parts of the base whereby close proximity of a human body part to the conductive coating of the base will cause the switch means to switch the mode of operation of the light bulb between at least the first and second mode of operation.

4,507,717

LUMINAIRE FOR STREET LIGHTING

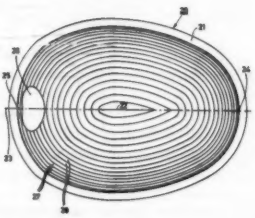
Hendrik Wijbenga, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,393

Claims priority, application Netherlands, Jul. 28, 1980, 8004311

Int. Cl.³ F21V *3/00*

U.S. Cl. 362—304 **2 Claims**



1. A luminaire for street lighting, comprising both a reflector system having a plane of symmetry and a light emanating face, and a lamp holder for receiving and positioning an associated elongate substantially cylindrical lamp with its axis located in parallel relationship to said plane of symmetry and parallel to the plane of said light emanating face, the reflector system having a reflecting surface at least the major part of which comprises elongate facets extending with their longitudinal sides substantially parallel to the light emanating face, the reflector system comprising a dish-shaped reflector, the light emanating face thereof being generally egg-shaped and whose facets are curved concave longitudinally and transversely, the width of said facets and their radius of transverse curvature being larger the nearer they are to the light emanating face, the depth of the dish-shaped reflector being 0.4 to 0.7 times as large as the largest dimension of the egg-shaped light emanating face, measured transverse to said plane of symmetry, said reflector comprising further facets, also curved transversely and longitudinally, which are located in a sector of the reflector situated at the blunt end of the light emanating face, and which have their longitudinal direction parallel to the plane of symmetry of the reflector.

4,507,718

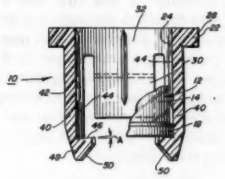
LED HOLDER

George J. Bury, Lake Villa, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 16, 1984, Ser. No. 590,307

Int. Cl.³ F21V *21/00*

U.S. Cl. 362—396 **3 Claims**



1. An improvement in a holder for a light emitting diode which is adapted to be installed in an aperture of a panel, where said holder has a one-piece flexible cylindrical body having a flange portion with a central opening, a pair of spaced apart integrally formed resilient short leg portions extending from said flange portion axially of said cylindrical body and a pair of spaced apart integrally formed resilient long leg portions extending from said flange portion axially of said cylindrical body and spaced ninety degrees from emitting diode which is adapted to be installed in an aperture of a panel, where said holder has a one-piece flexible cylindrical body having a flange portion with a central opening, a pair of spaced apart integrally formed resilient short leg portions extending from said flange portion axially of said cylindrical body and a pair of spaced apart integrally formed resilient long leg portions extending from said flange portion axially of said cylindrical body and spaced ninety degrees from said short leg portions, said short leg portions including a means for latching said holder in an aperture on said panel, the improvement comprising: a retaining shoulder integrally formed at the extremity of each of said pair of long leg portions and extending inward of said cylindrical body, each of said retaining shoulders being disposed at an angle toward said flange portion in the range of three degrees to eight degrees relative to a radial line extending from the axis of said cylindrical body.

4,507,719

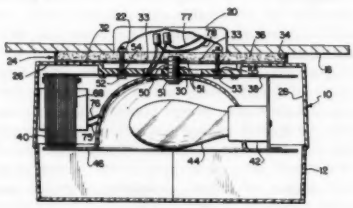
HEAT DISSIPATOR FOR PLASTIC LUMINAIRE

Honesto D. Quiogue, Blacksburg, Va., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Nov. 17, 1983, Ser. No. 552,619

Int. Cl.³ F21S *1/04*

U.S. Cl. 362—404 **3 Claims**



1. A heat dissipation structure for a lighting fixture of the type having a housing of polymeric material with a back wall intended to be mounted adjacent a wall or ceiling mounting surface with an open side facing away from the surface, a translucent refractor covering the open side of the housing, heat generating electrical circuit means including a lamp

within the housing and a reflector between the housing and the lamp, the heat dissipating structure comprising

means defining openings through said back wall;

a radiator pan comprising a shallow metal pan having a first wall in contiguous parallel relationship with said back wall of said housing and four relatively short side walls extending away from said housing;

means defining openings in said first wall of said pan in register with said openings through said back wall;

a body of heat insulating material in said pan;

fastener means extending through said back wall of said housing, said pan and said insulating material to hold the open side of said pan adjacent said mounting surface; and

heat conducting means interconnecting said reflector and said pan for conducting heat to said pan for dissipation to the surrounding atmosphere.

4,507,720

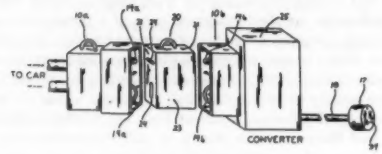
AUTOMOTIVE/HOME POWER INTERCONNECTION SYSTEM

Nick P. Colbrese, Homewood, Ill., assignor to Safe-T-Plug, Inc., Simi Valley, Calif.

Filed Jul. 26, 1982, Ser. No. 400,291

Int. Cl.³ H02M 7/00

U.S. Cl. 363—13 **8 Claims**



1. A system for connecting the electrical system of an electrical source having a first electrical output, for converting said first electrical output of such source to a second electrical output of differing electrical characteristics from those of said first electrical output, and for providing said second electrical output to external electrical devices, said system comprising:

battery access connection means for connecting the input of said system to said electrical source, said battery access connection means comprising first male plug connection means operably connected to said electrical source, said first male plug connection means including a multiplicity of male electrically conducting first prong means, said first prong means being geometrically polarized for permitting connection to cooperating female plug connection means in one orientation only;

second male plug connection means having male electrically conducting second prong means which are geometrically polarized for removable operable electrical connection with said female plug connection means and, in turn, said electrical source;

said female plug connection means further including a multiplicity of female electrically conducting socket means, said female socket means being designed to cooperate with and slidably engage said male electrically conducting first and second prong means of said respective first and second male plug connection means as well as insulating body means of suitable insulating material, said body means substantially encasing said female electrically conducting socket means, said body means further including respective apertures aligned therewithin said body means with said female electrically conducting socket means, whereby said first and second male electrically conducting prong means may pass through said apertures and slidably engage said female socket means, said female plug connection means and said insulating body means being integrated to form a single assembly in which said corresponding female electrically conducting socket means are internally electrically connected,

converter means operably and electrically integrated with said second male plug connection means and, in turn, said electrical source for converting said first electrical output of said source to said second electrical output of differing electrical characteristics;

first insulated electric cable means with a multiplicity of electrical conductors, said insulated electric cable means being attached to said second male plug connection means at said cable's first end, said multiplicity of conductors being attached to said multiplicity of male electrically conducting second prong means, and said first insulated electric cable being attached to said converter means at its second end;

output connection means for connecting said second electrical output of said converter means to external loads; and

output insulated electric cable means with a multiplicity of electrical conductors, said output insulated electric cable means being attached at its first end to the output of said converter means, and attached at its second end to said output connection means.

4,507,721

DC-DC CONVERTER FOR REMOTE POWER FEEDING

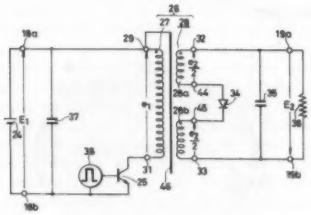
Seiichi Yamano, Yokosuka, and Haruo Ogiwara, Higashimurayama, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 515,754

Claims priority, application Japan, Jul. 28, 1982, 57-132364; Jul. 28, 1982, 57-132365

Int. Cl.³ H02N 3/335

U.S. Cl. 363—21 **4 Claims**



1. A DC-DC converter for remote power feeding which is connected via a power separating filter to a signal line on which an AC signal is superimposed on DC power, comprising:

an input capacitor connected to said power separating filter and supplied with the DC power separated by said power separating filter;

a transformer whose input and output sides float off ground, said transformer including a primary winding coupled to a pair of input terminals, a secondary winding having its opposing ends coupled to a pair of output terminals respectively, and an electrostatic shield interposed between said primary and secondary windings, one of said input terminals of said primary winding being connected to one side of said input capacitor, and said secondary winding being opened at its center winding point to provide two center terminals;

switching means connected between the other input terminal of said primary winding and the other side of said input capacitor, for supplying electric energy stored in said input capacitor to said primary winding through a switching operation; and

voltage balancing means operative to cause the AC voltage induced in a one half winding portion of one of said windings, relative to a center point on said one of said windings, to be substantially equal in potential and substantially

opposite in polarity to the AC voltage induced in the other half winding portion of said one of said windings thereby to suppress common mode noise resulting from operation of said switching means, said voltage balancing means including rectifying means connected between said two center terminals of said secondary winding, and an output capacitor connected between said output terminals of said secondary winding;

said electrostatic shield being connected to a zero potential point in the primary side circuit which includes said primary winding, said switching means and said input capacitor.

4,507,722

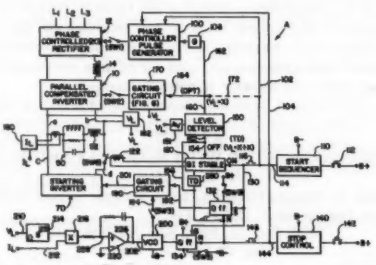
METHOD AND APPARATUS FOR CONTROLLING THE POWER FACTOR OF A RESONANT INVERTER

Shashi B. Dewan, Toronto, Canada, and Graham R. Adams, Boaz, Ala., assignors to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Division of Ser. No. 325,750, Nov. 30, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,281

Int. Cl.³ H02P *13/20*

U.S. Cl. 363—79 **4 Claims**



1. A circuit for controlling the frequency of gating signals for the switching devices of a D.C. to A.C. inverter having an output to be connected across a load, said circuit comprising: means for detecting the load voltage to obtain a voltage wave; means for detecting the load current to obtain a current wave; means for shifting one of said waves by substantially 90°; means for multiplying said one wave and the other of said waves to produce the product thereof; means for comparing said product with a reference to produce a control signal; and means for adjusting the frequency of said gating signals in accordance with said control signal.

4,507,723

METHOD FOR ADAPTIVE CONTROL IN A POWER CONVERTER OPERATING IN A DISCONTINUOUS CURRENT MODE

William D. Brackman, Jr., Salem; John D. D'Atre, Charlottesville, and Loren H. Walker, Salem, all of Va., assignors to General Electric Company, Salem, Va.

Filed Jan. 14, 1983, Ser. No. 458,108

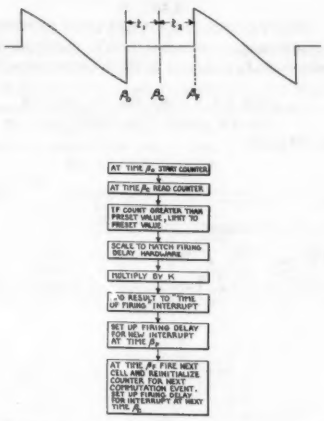
Int. Cl.³ H02M *7/155*

U.S. Cl. 363—87 **10 Claims**

1. For use in conjunction with a phase controlled power conversion bridge employing controlled devices for supplying electrical current to a load, a method for improving the linear relationship between the load voltage of the bridge and a command for determining the load voltage comprising:

(a) sensing the time at which the load current becomes discontinuous;

(b) determining a time period between the time the current becomes discontinuous and a predetermined time, not later than the time of rendering the next controlled device of the bridge conductive; and,


AT TIME A_B START COUNTER
AT TIME A_C READ COUNTER
IF COUNT GREATER THAN PRESET VALUE, LIMIT TO PRESET VALUE
SCALE TO MATCH FIRING DELAY HARDWARE
MULTIPLY BY K
GO RESULT TO TIMER UP FIRING INTERRUPT
SET UP FIRING DELAY FOR NEW INTERRUPT AT TIME A_F
AT TIME A_F FIRE NEXT CELL AND REINITIALIZE COUNTER FOR NEXT COMMUTATION EVENT. SET UP FIRING DELAY FOR INTERRUPT AT NEXT TIME A_B

(c) determining an actual time for rendering the next controlled device conductive as a function of the predetermined time and said time period.

4,507,724

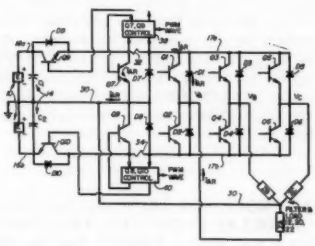
PULSE WIDTH MODULATED INVERTER FOR UNBALANCED AND VARIABLE POWER FACTOR LOADS

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 17, 1983, Ser. No. 542,578

Int. Cl.³ H02P *13/20*

U.S. Cl. 363—98 **13 Claims**



1. In an n-phase inverter for generating polyphase AC power from a DC source having two terminals coupled to the inverter through bus lines, the inverter having rails coupled to the bus lines and outputs connected to a load, the improvement comprising:

a first switch connected between one of the bus lines and one of the rails;

a second switch coupled between the one rail and the other bus line;

means coupled to the one rail for sensing the direction of current therein, such current being in a particular direction when power developed by the load attempts to return to the DC source; and

means coupled to the sensing means and to the first and second switches for operating the switches whereby the first switch is opened and the second switch is closed to shunt current through the second switch from the one rail

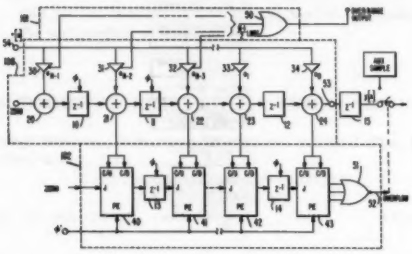
when the current in the one rail flows in the particular direction to thereby prevent such current from being returned to the DC source.

4,507,725

DIGITAL FILTER OVERFLOW SENSOR

Lauren A. Christopher, Weedsport, N.Y., and David L. Sprague, Plainsboro, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,326
Int. Cl.³ G06F *7/38;* H03H *7/28*
U.S. Cl. 364—724 **7 Claims**



1. A sampled data input weighted FIR filter of the type including alternately connected ADDER circuits and delay stages in a serial chain wherein input samples are multiplied by coefficients and applied in parallel to said ADDER circuits for addition therein to sums from preceding ADDER circuits stored in said delay stages and wherein said ADDER circuits are subject to sum overflows; respective COUNTER circuits are coupled to each ADDER circuit to respond to sum overflows, said COUNTER circuits being serially connected one to another by delay stages wherein the overflow count of each counter is translated to a successive counter in consonance with the sum in the ADDER circuit coupled to the respective counter being translated to a successive ADDER circuit coupled to said successive counter, each counter adding to the count therein provided from the previous counter a value corresponding to the overflow condition of the ADDER circuit to which it is coupled, the last COUNTER circuit containing the net number of overflows corresponding to the output sum of said ADDERS, which overflow signal is indicative of the state of correctness of the output sample of said ADDERS.

4,507,726

ARRAY PROCESSOR ARCHITECTURE UTILIZING MODULAR ELEMENTAL PROCESSORS

Jan Grinberg, Los Angeles; Robert D. Etchells, Topanga; Graham R. Nudd, and Siegfried Hansen, both of Los Angeles, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 26, 1982, Ser. No. 342,630
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **15 Claims**

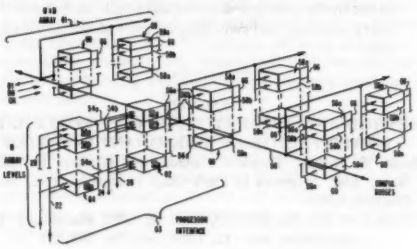
1. An array processor for analyzing a two-dimensional array of data elements arranged in a set of data locations spatially related to each other, comprising:

a plurality of parallel elemental processors logically organized as a multi-level matrix where each elemental processor is associated with a particular data location, each said elemental processor including a plurality of modules logically distributed over the multiple levels of said matrix so that each level includes no more than one module from each elemental processor;

memory means in each module for storing one or more data elements, whereby a set of data elements spatially associated with said set of data locations may be stored in a group of modules which are on a common matrix level;

transfer means associated with each elemental processor for transferring stored data elements between modules of that same elemental processor;

logic means in each module for performing generalized logic functions on at least one data element as said element is transferred to that module; and



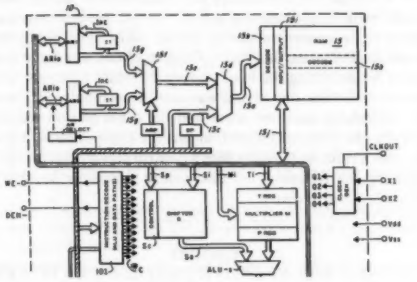
control means for selecting particular logic means and for causing said transfer means to transfer, simultaneously, a set of data elements stored in the memory means of modules on one matrix level to the modules on one other matrix level, whereby the spatial association between said set of data elements and said set of data locations before and after said transfer remains the same.

4,507,727

MICROCOMPUTER WITH ROM TEST MODE OF OPERATION

Surendar S. Magar, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 11, 1982, Ser. No. 348,124
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **8 Claims**



1. A microcomputer system comprising:

(a.) a microcomputer device formed in a single integrated circuit and having data terminals:

(b.) memory means having an input and output, and input-/output peripheral means having an input and an output, both said memory means and said peripheral means being external to the microcomputer device:

(c.) external data bus means coupled to the data terminals of the microcomputer device, coupled to said input and output of the memory means, and coupled to said input and output of the input/output peripheral means;

(d.) the microcomputer device comprising:

an arithmetic/logic unit having data input and data output;

an internal data memory including a memory cell array;

said data memory having an address input, and having data input/output means coupled to said cell array;

internal data bus means coupled to the data input and data output of the arithmetic/logic unit, and coupled to the address input and the data input/output means of the data memory;

an internal program memory having an address input and having an instruction output, the program memory being permanently-programmed and storing instruction words;

program address means connected to the address input of the program memory means;

control means having an input, said control means generating controls in response to instruction words, the controls defining operation of the arithmetic/logic unit and transfer to and from the internal bus means;

internal program bus means separate from the internal data bus means; said program bus means being coupled to said instruction output, to said input of the control means, and to said program address means;

bus interchange means for transferring instruction words from the program bus means to the internal data bus means without applying such instruction words to said input of the control means, and means to transfer said instruction words to said input of the control means, and means to transfer said instruction words from the internal data bus means to the external data bus means via said data terminals, to provide a test mode of operation.

4,507,728

DATA PROCESSING SYSTEM FOR PARALLEL PROCESSING OF DIFFERENT INSTRUCTIONS

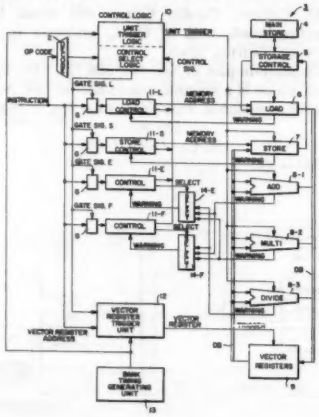
Kazushi Sakamoto, Kawasaki; Tetsuro Okamoto, Machida, and Shigeaki Okutani, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 9, 1982, Ser. No. 356,468

Claims priority, application Japan, Mar. 20, 1981, 56-39536

Int. Cl.³ G06F *9/38*

U.S. Cl. 364—200 **14 Claims**



1. A data processing system for parallel processing, connected to a plurality of operation units, each of which executes a different instruction, respectively, and a local storage, comprising:

a plurality of instruction control means, connected to the respective operation units and the local storage, for reading, writing and parallel instruction execution control, each of which includes at least two stages for reading out source operand data from the local storage and for writing the result operand data into the local storage, and each of said instruction control means controls different instruction executions in parallel, each of said at least two stages comprises registers which hold an operation code of the respective instruction and operand addresses.

4,507,729

ERROR PROCESSING SYSTEM USING TWO DIFFERENT TYPES OF REPLACE LOGIC

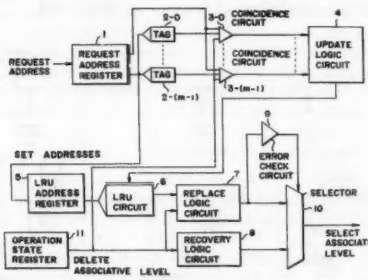
Masanori Takahashi, Tokyo, and Terutaka Tateishi, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,318

Claims priority, application Japan, Aug. 27, 1981, 56-134572

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **15 Claims**



1. An error processing system for buffer storage which is provided with first replace block designating means for storing some of blocks into which a main storage is divided and, when a new block is to be stored, for designating a block to be replaced using least recently used logic for designating the least recently used block as the block to be replaced, the error processing system comprising:

error detecting means, connected to the first replace block designating means, for detecting an error in the least recently used logic in which the first replace block designating means does not designate the block to be replaced; and

second replace block designating means, connected to said error detecting means, for designating a block to be replaced using logic different from the least recently used logic of the first replace block designating means; and

wherein the block designated by said second replace block designating means is designated as the block to be replaced in response to the detection of the error by said error detecting means.

4,507,730

MEMORY SYSTEM WITH AUTOMATIC MEMORY CONFIGURATION

Robert B. Johnson, Billerica; Chester M. Nibby, Jr., Peabody, and Edward R. Salas, Billerica, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 307,542, Oct. 1, 1981, abandoned. This application Sep. 3, 1982, Ser. No. 413,631

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **46 Claims**

1. A data processing system comprising a data processing unit and a memory system including a plurality of addressable memory controllers, each controller for controlling the operation of a memory including a plurality of memory modules included on a corresponding number of daughter boards in response to memory commands, said controllers being coupled in common to a bus for receiving said memory commands and data from said processing unit, each memory command including an address portion including a plurality of address bits

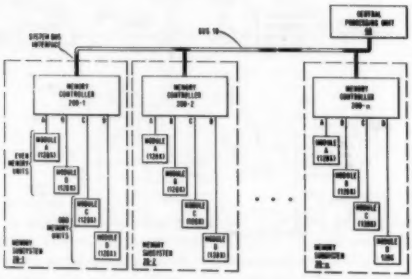
coded to specify which one of said controllers is to perform the operation specified by said command and each memory controller including:

a reconfiguration control section coupled to said bus, said reconfiguration section for reconfiguring said controller within said system in response to memory commands, said section comprising:

register means for storing indications defining the type of controller memory reconfiguration in addition to controller address signals;

selectable switching means, said switching means defining the address of said controller within said memory system;

output selection means coupled to said register means and to said switching means, said output selection means for providing signals representative of said controller address during a reconfigured mode of operation; and,



mode control means coupled to said bus and to said output selection means, said mode control means being switched to a predetermined state in response to a predetermined type of memory command defining a reconfiguration mode of operation for the controller specified by said command address portion, said mode control means when in said predetermined state conditioning said output selection means to apply said controller address signals from said register means as said signals representative of said controller address in lieu of said address from said switching means, enabling reconfiguration of said each memory controller of said plurality of memory controllers within said memory system as required for providing a contiguous addressable memory space.

4,507,731

BIDIRECTIONAL DATA BYTE ALIGNER

Brian D. Morrison, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 1, 1982, Ser. No. 438,142

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—200 **57 Claims**

1. In combination:

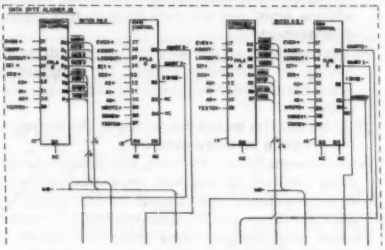
system bus means for delivering digital bytes of information to a memory means and receiving digital bytes of information from said memory means;

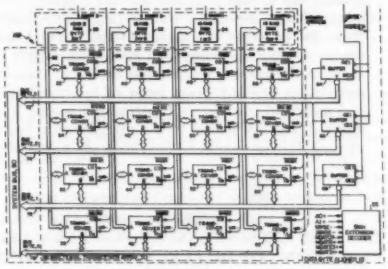
transceiver means for transferring at least one of a plurality of said digital bytes between said memory means and said system bus means;

first byte bus means for transferring at least one of said bytes between said system bus and a first port of said transceiver means;

second byte bus means for transferring at least one of said bytes between a second port of said transceiver means and said memory means;

means for controlling writing and reading memory accesses starting at any byte location within said memory means; and





means for controlling said transceiver means when transferring at least one of said bytes between said memory means and said system bus.

4,507,732

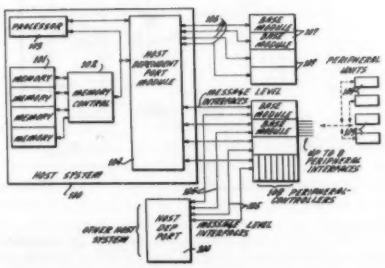
I/O SUBSYSTEM USING SLOW DEVICES

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 308,721, Oct. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 052,821, Jun. 27, 1979, abandoned. This application Sep. 7, 1983, Ser. No. 529,005

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **5 Claims**



1. In a network providing a basic clock signal to an I/O processor means, where an I/O Processor System controls data transfers between a main host computer and a peripheral terminal, and wherein data being transferred is edited and processed by said I/O processor system at a faster rate than it can be accepted by an attached application dependent logic module, the I/O Processor System comprising:

(a) I/O processor means for controlling an application dependent logic module, and I/O processor means including:

(a1) means for accessing data-in-transit in said application dependent logic module and processing said data for return to said application dependent logic module;

(a2) means, responsive to a wait-delay signal from said application dependent logic module, for slowing the data transfer rate from said I/O processor means to an external register means and to an external RAM memory means, said external register means and said external RAM memory means functioning to temporarily store data-in-transit within said application dependent logic module;

said means for slowing including:

(a2a) delay circuit means having a first said basic clock signal input and said second wait-delay signal input for providing a processor clock output signal for clocking said I/O processor means;

(b) said application dependent logic module for providing data transfers between said main host computer and said peripheral terminal, said application dependent logic module including:

(b1) said external register means connected to said main host computer and to said peripheral terminal for temporary storage of data-in-transit;

(b2) said external RAM memory means connected to said I/O processor means and to said external register means, said RAM memory means for temporary storage of data before and after processing by said I/O processor means;

(b3) and wherein said external register means and said external RAM memory means is only capable of accepting data at a rate slower than the output data rate capability of said I/O processor means;

(b4) means to sense when said external register means and/or said external RAM memory means is addressed by said I/O processor means;

(b5) means, responsive to said means to sense, to generate said wait-delay signal to said I/O processor means, said wait-delay signal operating to slow the transfer rate of data from said I/O processor means to said external register means or to said external RAM memory means.

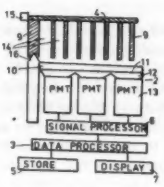
4,507,733
PHOTON EMISSION IMAGING APPARATUS AND METHOD

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 173,962, Jul. 31, 1980,. This application Jul. 6, 1982, Ser. No. 394,898

Int. Cl.³ G01T *1/20*

U.S. Cl. 364—414 **19 Claims**



13. A system for imaging a distributed radiation emitting source with scintillation means in the path of said radiation to provide light indications of individual radiation events, having a plurality of photodetector means viewing said light indications in said scintillation means, and data processing means connected to signal processing means, said signal processing means connected in turn to said photodetector means for processing photodetector signals in response to said light indications to provide radiation response data indicative of the energy and location of each radiation event, and means responsive to said radiation response data for displaying a representation of the correct location of the source of the radiation, and collimator means composed of radiation opaque material having holes therethrough, said collimator means interposed between said radiation emitting source and said scintillation means to remove some off-axis radiation by shielding so that radiation striking said scintillation means will approximate a planar projection of the distribution of radiation at the source, wherein the improvement comprises: rejecting means for rejecting from the image in said displaying means, radiation response data obtained from radiation striking said scintillation means at certain regions of said scintillation means at certain regions of said scintillation means which bear a particular geometric relationship to said holes in said collimator means, said rejecting enhancing image quality by discarding certain off-axis radiation which degrades image resolution and passes through said collimator means when said source is not at the surface of said collimator means, said rejection means including non-homogenous scintillation means composed of radiation unresponsive material at certain regions of said scintillation means which bear a particular geometric relationship to said holes in said collimator means to discard certain off-axis radiation from image formation and composed of radiation responsive material at those regions of said scintillation means centered beneath said collimator holes to thereby limit radiation responsiveness to on-axis radiation to enhance image resolution.

4,507,734
DISPLAY SYSTEM FOR DATA IN DIFFERENT FORMS OF WRITING, SUCH AS THE ARABIC AND LATIN ALPHABETS

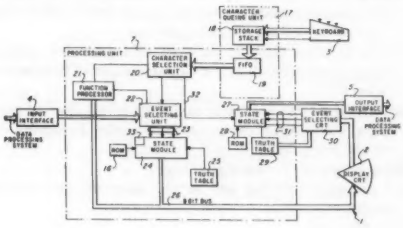
George A. Kaldas, Villeneuve-Loubet, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 15, 1981, Ser. No. 302,018

Claims priority, application France, Sep. 17, 1980, 80 20007

Int. Cl.³ G06F *15/38, 15/00;* **B41J** *5/00*

U.S. Cl. 364—419 **10 Claims**



1. A system for displaying data in at least first and second alphabets selectable by the operator, the second alphabet being of the kind in which the characters differ in form according to their position in the context, the system being adapted to receive data in the form of a sequence of standard binary code bytes representing alpha-numeric characters in the first alphabet, alpha-numeric characters in the second alphabet in which the characters are presented in one of the various forms possible for them in accordance with their position in the context, punctuation marks in the two alphabets, and editing functions, comprising:

(a) display means;

(b) ROM means electrically connected to the display means, for storing, in addition to the forms of the alpha-numeric characters of the first alphabet, all the forms of all the alpha-numeric characters of the second alphabet including the form transmitted in the standard binary code and corresponding forms depending upon their respective positions in the context; and

(c) processing means, electrically connected to the display means and to the ROM means for receiving the sequence of standard binary code bytes and for determining to which of the two alphabets to be displayed the character

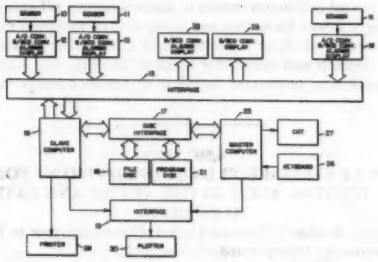
of the byte belongs and to select from the ROM means the form of the character to be displayed, such form being determined, in the case of the second alphabet, in dependence upon the position of the character in the context including as an isolated character, and as a character at the beginning, intermediate position or at the end of a word.

4,507,735

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING WELL DRILLING PARAMETERS

Robert M. Moorehead; Susan G. Eppler, and Mardis V. Anderson, all of Richardson, Tex., assignors to Trans-Texas Energy, Inc., Dallas, Tex.

Filed Jun. 21, 1982, Ser. No. 390,577
Int. Cl.[3] G06F *3/00, 15/16;* **E21B** *47/00*
U.S. Cl. 364—422 **17 Claims**



1. A mud logging system for receiving and displaying conditions measured during the drilling of a well comprising:

(a) a plurality of units operative independently of each other for receiving and processing signals from sensors responsive to the values of the conditions,

(b) A/D converters in each of said units for producing digital representations of signals received from said sensors,

(c) visual display means in said units responsive to the outputs of said A/D converters for digitally displaying values of the conditions,

(d) a computer of the digital type,

(e) means interfacing said A/D converters and said computer,

(f) a file disk,

(g) means under control of said computer for transferring the digital representations to said file disk, and

(h) a recorder under control of said computer for continuously displaying selected ones of said conditions.

4,507,736

TRANSMISSION GEAR SHIFT CONTROL SYSTEM

Alfred Klatt, Wathlingen, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 348,038
Int. Cl.[3] G05G *5/04;* **F16H** *57/06*
U.S. Cl. 364—424.1 **7 Claims**

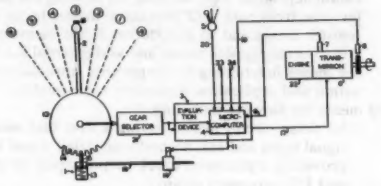
1. Gear shift control apparatus for the transmission of a motor vehicle including a gear shift lever, means for producing a code signal representative of different positions of the gear shift lever, and evaluation means for selecting and controlling the setting of the gears of said transmission in accordance with said code signal, wherein the invention comprises:

(a) a gear shift latch to lock the gear shift lever in any one of said different positions;

(b) a speed sensor associated with the transmission output shaft to provide a signal according to the output speed of said transmission;

(c) a position sensor to provide a signal according to the gear position in which said transmission is currently operating;

(d) said evaluation means further including electronic means responsive to said speed sensor and said position sensor signals, and to said code signal for providing a signal



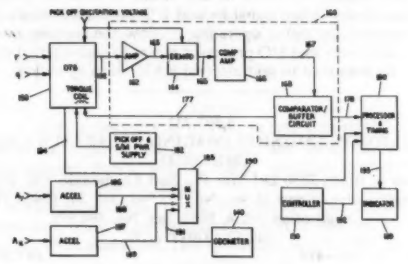
corresponding to a projected engine speed, and for further providing an output signal for effecting operation of said latch to lock said gear shift lever when said projected engine speed signal lies outside the limits of a predetermined speed range.

4,507,737

HEADING REFERENCE AND LAND NAVIGATION SYSTEM

Eugene A. LaSarge; Franciscus Schermers, both of Grandville, and Daniel L. Sugarbaker, Grand Rapids, all of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 20, 1981, Ser. No. 313,207
Int. Cl.[3] G06F *15/50*
U.S. Cl. 364—453 **6 Claims**



1. A self-contained strapped-down heading reference system for use in a land-based vehicle to provide a visual indication to vehicle operators of directional vehicle heading relative to a fixed reference azimuth axis, the heading system comprising:

a housing for mounting the heading system in the vehicle, wherein the housing is oriented so as to define a roll axis corresponding to the direction of vehicle travel, a pitch axis perpendicular to the roll axis and forming a horizontal plane therewith when the vehicle is on level terrain, and a yaw axis mutually perpendicular to the pitch and roll axes and parallel to the azimuth axis when the vehicle is on level terrain;

gyroscopic means mounted in the housing for sensing the rate of vehicle rotation about the yaw axis and the pitch axis, and for generating rate signals indicative of the sensed vehicle rotation;

accelerometer means for measuring the magnitude of vehicle acceleration only along the roll and pitch axes and for generating acceleration signals indicative of the misalignment of the vehicle relative to a horizontal plane formed by the pitch and roll axes;

circuit means coupled to the gyroscopic means and responsive to the rate signals for generating force signals corre-

sponding to the magnitude of forces necessary to align the gyroscopic means to an initial null position;

processor means responsive to the force signals and acceleration signals for generating a heading signal representative of the angular deviation of the direction of the vehicle relative to the azimuth axis;

measuring means connected to the processor means for generating a displacement signal so as to provide a ground-referenced displacement of the vehicle relative to an initialization position; and

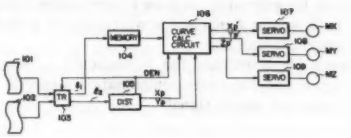
the processor means is responsive to the displacement signal for compensating the heading signal in accordance with the distance travelled by the vehicle.

4,507,738

NUMERICAL CONTROL METHOD

Ryoichiro Nozawa, Tokyo, and Hideaki Kawamura, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Oct. 8, 1982, Ser. No. 433,560
Claims priority, application Japan, Oct. 9, 1981, 56-161238
Int. Cl.[3] G06F *15/46;* G05B *19/18*
U.S. Cl. 364—474 **8 Claims**



1. A numerical control method for moving a tool along a commanded curve on a curved surface, comprising the steps of:

entering the curved surface defined by one of data representing a mathematical expression and a group of numerical data;

entering numerical control data specifying a projected curve obtained by projecting the commanded curve onto a predetermined plane;

finding positional coordinates successively on the commanded curve through use of the curved surface data and numerical control data specifying the projected curve; and

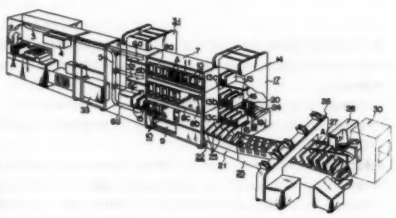
controlling the position of the tool on the basis of said positional coordinates.

4,507,739

SORTER SYSTEM FOR POSTAL MATTER

Kazuhito Haruki, Kawasaki; Takeshi Kohno, Yokohama, and Yasuo Nagase, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 14, 1982, Ser. No. 378,412
Claims priority, application Japan, May 19, 1981, 56-75162
Int. Cl.[3] G06F *15/20*
U.S. Cl. 364—478 **3 Claims**



1. A letter sorting machine (LSM) system, comprising:

(A) a plurality of LSMs having a function to selectively sort postal matter primarily and secondarily in accordance with postal codes, each of said LSMs including:

means for reading destination data on postal matter,

a plurality of bins vertically disposed in a plurality of stages, said postal matter being stacked thereon,

a pickup mechanism for each bin,

means for sorting and stacking the postal matter in said plurality of bins on the basis of the destination data from said reading means,

a transfer mechanism which cooperates with each of said bins for transferring stacked postal matter from said plurality of bins,

a label printer for printing a destination label and applying said label on said stacked postal matter transferred by said transfer mechanism, and

a bundling unit for bundling the labelled postal matter by destination as defined by the attached label;

(B) schedule table means for determining a primary sortation mode and a secondary sortation mode to sort said postal matter by postal code;

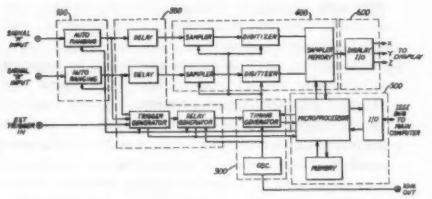
(C) computer means connected to said plurality of LSMs for determining, in accordance with said schedule table means, the number of said LSMs to be operated and the particular LSMs for said primary sortation and said secondary sortation modes depending upon the amount of postal matter to be sorted.

4,507,740

PROGRAMMABLE SIGNAL ANALYZER

Albert A. Star, Dix Hills, and John M. Weick, Centerport, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,254
Int. Cl.[3] G06F *15/31*
U.S. Cl. 364—487 **8 Claims**



1. A remotely programmable multi-channel signal analyzer for automatically evaluating and displaying selected parameters of analog input signals comprising:

a. a plurality of signal channels wherein each of said plurality of signal channels is configured to process automatically one analog input signal and includes;

1. autoranging means for normalizing the amplitude of the analog input signal within a window having predetermined positive and negative values;

2. delay means operatively connected to said autoranging means for generating sampling signals to selectively sample the normalized analog signal; and

3. digital conversion means connected to said delay means and including non-real time sampling mean for converting the normalized analog signal into digital data;

b. means for storing the digital data resulting from the digital conversion of each of the normalized analog signals;

c. reference timing means for generating a timing base for the analyzer;

d. microprocessor means responsive to said reference timing means for controlling automatically the operation of said plurality of signal channels and said storing means, said microprocessor means running a program for manipulating the stored digital data such that values of selected

parameters for each of the analog input signals are calculated, said microprocessor means further including interface means for effecting communication between the analyzer and an external controller thereby providing the analyzer with a remote programming capability; and

e. display means connected to said storing means for displaying the calculated values of the selected parameters for each of the analog input signals.

4,507,741

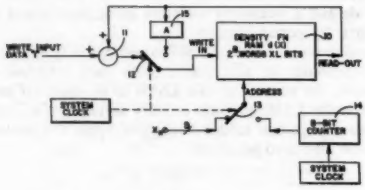
COMPUTING DEVICE

Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1982, Ser. No. 346,829

Int. Cl.³ G06F *15/36*

U.S. Cl. 364—554 **17 Claims**



1. A digital data processor adapted to be responsive to an applied signal input (x_n) for generating an output signal indicative of a preselected function of said signal input, and comprising:

a clocked counter for providing a clocked counter output;

multiplexing means having a multiplexing means output and having inputs responsive to said applied signal input and said clocked counter output, said multiplexing means operating to toggle said multiplexing means output to alternate between said applied signal input and said clocked counter output;

signal sampling memory means adapted to be responsive to an alternate one of said applied input signal and said clocked counter output provided by said multiplexing means output as a read/write address for generating a statistical amplitude density function d(x) representing the number of occurrences of an amplitude of a sampled input x by alternating said memory means between a first mode in which input data is loaded into said memory means responsive to said applied input signal, and a second mode in which data stored in said memory means is attenuated in said memory means responsive to said clocked counter output;

digital attenuating means interposed between a read-out and read-in of said memory means during said second mode in which said memory means is responsive to said clocked counter output for low-pass filtering the amplitude density function as to be independent of the size of the sampled population of the sampled signal (x_n); and

output means for producing said output signal in response to data stored in said memory means.

4,507,742

AIRCRAFT WEIGHT AND BALANCE SYSTEM WITH AUTOMATIC LOADING ERROR CORRECTION

Charles D. Bateman, Bellevue, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

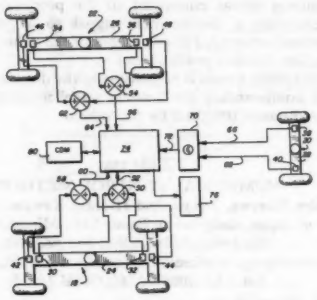
Filed Jul. 30, 1982, Ser. No. 403,438

Int. Cl.³ G01M *1/12*

U.S. Cl. 364—567 **30 Claims**

1. In a weight measuring system for an aircraft having a landing gear and means for generating a weight signal representing aircraft weight on the landing gear, a system for correcting loading errors in the generated weight signal comprising:

means for holding a weight signal upon the occurrence of an aircraft condition;



means for generating an error compensation signal from said held weight signal and a weight signal generated subsequent thereto; and

means for combining the subsequently generated weight signal and the error compensation signal to generate a corrected weight signal.

4,507,743

CALCULATION SYSTEM UTILIZING DEFINABLE KEYS

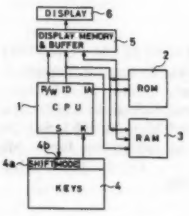
Isamu Haneda, and Tetsuo Myooi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 233,506, Feb. 11, 1981, abandoned. This application Sep. 27, 1983, Ser. No. 535,552

Claims priority, application Japan, Feb. 12, 1980, 55-15677

Int. Cl.³ G06F *15/06*

U.S. Cl. 364—709 **3 Claims**



1. A programmable calculator for manipulating keyed information in accordance with a stored program, said calculator comprising:

key input means for receiving keyed information;

step selection means for selecting a program step requiring desired information;

means, responsive to said key input means and said means for selecting, for locating when said calculator is in a define mode said desired information with said entered keyed information; and

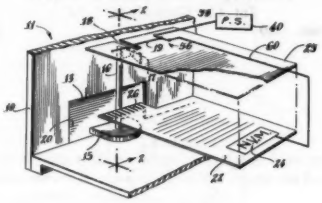
means responsive to said step selection means for initiating and running the stored program beginning with said selected step by utilizing said located desired information.

4,507,744

ACCESSIBLE HOUSING FOR ELECTRONIC SYSTEM

Robert B. McFiggans, Stamford, and Arno Muller, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 399,594
Int. Cl.[3] G06F *15/21*
U.S. Cl. 364—708 11 Claims



1. An electronic calculating device comprising a memory means having accounting information registered thereon, a control means for calculating the accounting information and entering the information into the memory means, a power supply providing power to the control means, a switch means having a first position in which an electrical connection is provided between the power supply and the control means and a second position in which the power supply is disconnected from the control means, the switch means being in the first position during normal operation of the calculating device, a secured housing enclosing the memory means, the control means, and the switch means and preventing access thereto during normal operation of the calculating device, an aperture in the housing permitting access to the memory means to read out accounting information registered thereon, a removable door covering the aperture, means for moving the switch to a second position when the door is removed, the switch being prevented from movement back to the first position when the door is removed unless authorized personnel are given access thereto and means for reading the accounting information out of the memory means through the aperture in the housing.

4,507,745

DATA PROCESSING APPARATUS HAVING ALTERABLE INTEREST RATE MODE CAPABILITY

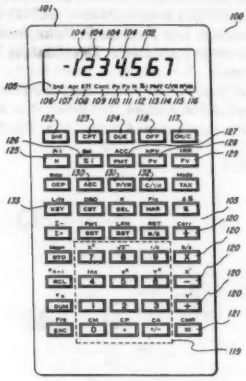
Mahendra P. Agrawal, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1981, Ser. No. 332,437
Int. Cl.[3] G06F *3/02*
U.S. Cl. 364—709 6 Claims

1. A data processing apparatus comprising:

an operator input means for entering numerical data and operational commands, said operational commands including (a) at least one interest rate dependent operational command corresponding to an interest rate dependent data processing function and (b) at least one interest rate mode designation command for designating one of a plurality of interest rate specification modes, said operator input means further includes means for designating one of a circularly sequential ordered set composed of said plurality of interest rate specification modes and means for designating the next sequential one of saidordered set of said interest rate specification modes upon entry of said interest rate mode designation command;

an arithmetic means, responsive to said input means, for performing entered operational commands on entered data and generating a result, including performing interest rate dependent operational commands on entered data in the designated interest rate specification mode; and



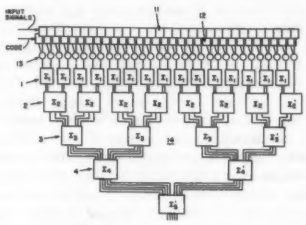
an output means for generating an operator perceivable indication of said result generated by said arithmetic means.

4,507,746

PROGRAMMABLE MATCHED FILTER FOR BINARY PHASE-CODED SIGNALS

Robert H. Fletcher, Jr., Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1982, Ser. No. 402,503
Int. Cl.[3] G06F *1/02*
U.S. Cl. 364—717 3 Claims



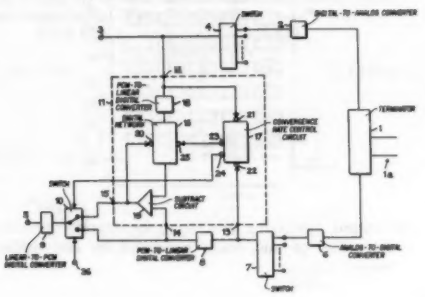
1. A system comprising first and second half adders each having two inputs and sum and carry outputs; a first network for summing the outputs of said first and second half adders comprising first, second and third outputs which represent a first output word with the third output being the highest bit level; a first OR gate having two inputs and an output; first means connecting the carry output of the first adder to one input of said first OR gate; second means for connecting the sum output of the second half adder to the other input of said OR gate; and third means for utilizing the sum output of said first half adder, the output of said OR gate, and the carry output of said second half adder as the first, second and third outputs of said network.

4,507,747

PROCEDURE FOR SHARED-TIME PROCESSING OF DIGITAL SIGNALS AND APPLICATION TO A MULTIPLEXED SELF-ADAPTING ECHO CANCELER

Jean-Pierre Houdard, and Philippe F. Patte, both of Colombes, France, assignors to Le Materiel Telephonique Thomson-CSF, Colombes, France

Continuation of Ser. No. 181,667, Aug. 26, 1980, abandoned. This application Jan. 14, 1983, Ser. No. 457,942
Claims priority, application France, Aug. 30, 1979, 79 21769
Int. Cl.[3] G06F 15/31
U.S. Cl. 364—724 6 Claims



4. In a digital filter for use in the share-time processing of digital signals for synthesizing from an incident signal a digital signal by approximating an "operand" digital signal, the improved apparatus comprising:

a convergence rate control circuit having an input for receiving said operand signal;

a pcm to linear digital convertor for converting said operand signal to a linear form of digital signals;

a proce sing circuit connected to the output of said convergence rate control circuit and having a first input circuit means for receiving said incident signal and a second input circuit means;

a subtract circuit having a first input for receiving digital samples in linear form of said operand signal output from said pcm to linear digital convertor and a second input for receiving the output of said processing circuit with the output of said subtract circuit being fed to said second input circuit means of said processing circuit;

a switch means whose first input is connected to the output of said subtract circuit and whose second input receives digital samples in linear form of said operand signal and whose output constitutes the output channel of said digital filter wherein said second input circuit means of said processing circuit comprises a difference memory whose input is connected to the output of said subtract circuit and whose output is connected to an error signal input of said processing circuit wherein said processing circuit comprises at least one processing module with each processing module comprising a delayed discrete value memory, a first multiplier-accumulator having a first input connected to the output of said discrete value memory, a second multiplier-accumulator having a first input connected to the output of said discrete value memory with the second input of said second multiplier-accumulator being connected to the output of said difference memory, a shift register whose input is connected to the output of said second multiplier-accumulator;

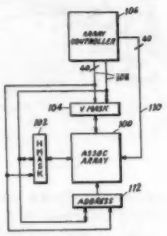
each said processing circuit further comprising a summing circuit having a first input connected to the output of said shift register, a coefficient memory whose input is connected to the output of said summing circuit and whose output is connected to the second input of said summing circuit with the second input of said first multiplier-accumulator being connected to the output of said summing circuit with the output of said first multiplier-accumulator being the output of said processing module.

4,507,748

ASSOCIATIVE PROCESSOR WITH VARIABLE LENGTH FAST MULTIPLY CAPABILITY

John M. Cotton, East Norwalk, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,242
Int. Cl.[3] G06F 7/38, 7/52
U.S. Cl. 364—749 21 Claims



1. An associative processor comprising:

an array of rows and columns of associative cells, each of said cells being adapted to simultaneously store a sum bit and a carry bit, and each of said cells including:

masking means for identifying that one or more particular cells contains either a multiplier or a multiplicand bit or any combination thereof;

means for storing a multiplicand bit;

means for multiplying the multiplicand bit with a multiplier bit;

means for enabling said cell during a multiplication operation such that said cell stores two bits of the multiplication result;

arithmetic logic unit means for serially receiving multiplier bits for adding or subtracting said masked multiplicand bit to the results of the arithmetic operation from the previous shift time to derive a current multiplication result; and

means for coupling said current multiplication result to the adjacent associative cell in the same shift time in which the current result is obtained, such that multiplication occurs simultaneously in adjacent cells for a multiplicand of arbitrary digit length and a multiplier of fixed or variable length.

4,507,749

TWO'S COMPLEMENT MULTIPLIER CIRCUIT

Masahide Ohhashi, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

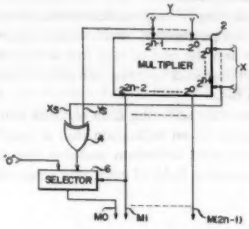
Filed Sep. 24, 1982, Ser. No. 423,246
Claims priority, application Japan, Dec. 10, 1981, 56-198853
Int. Cl.[3] G06F 7/52
U.S. Cl. 364—757 5 Claims

1. A digital multiplication circuit comprising:

multiplication means for multiplying a multiplier X of a signed binary code represented in terms of the two's complement of n bits by a multiplicand Y of a signed binary code represented in terms of the two's complement of n bits to thereby generate a multiplication output data of binary code represented in terms of the two's complement;

sign bit generating means for generating an output bit "0" when a sign bit X_S of the multiplier, a sign bit Y_S of the multiplicand Y and a bit M1 in a (2n−1)th bit position from the least significant bit position of the multiplication output data from said multiplication means are all "1" and

generating an output bit equal to the (2n−1)th bit M1 when at least one of the bits X_S, Y_S and M1 is "0",



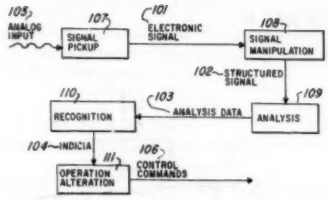
whereby the multiplication output data from said multiplication means is a numeral and the output bit from said sign bit generating means is a sign bit.

4,507,750

ELECTRONIC APPARATUS FROM A HOST LANGUAGE

Gene A. Frantz, and Kun-Shan Lin, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1982, Ser. No. 377,734
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **12 Claims**



1. An electronic apparatus comprising:

memory means having digital data stored therein including a first plurality of digital speech data templates respectively representative of synthesized speech in a host language as grouped in speech segments of the host language, and a second plurality of digital data templates representative of a non-host language and having corresponding counterparts in said first plurality of digital speech data templates representative of synthesized speech in the host language;

operator input means including at least speech input means for receiving at least one word as spoken speech from an operator, said speech input means converting the operator-generated speech into an analog speech signal representative of a sequence of speech segments spoken by the operator;

speech analysis means operably connected to said operator input means for analyzing said analog speech signal and generating a sequence of speech data sets representative thereof;

control means operably connected to said speech analysis means and to said memory means and including speech recognition means for matching each respective speech data set from said speech analysis means with a particular digital speech data template of said memory means in response to the respective speech data set and the remaining speech data sets within said sequence of speech data sets and providing as a control signal output the digital data template of said second plurality of digital data templates representative of the non-host language; and

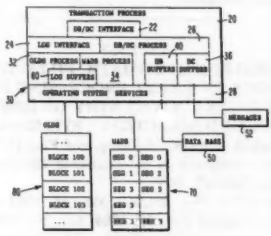
output means coupled to said control means for receiving the control signal output therefrom.

4,507,751

METHOD AND APPARATUS FOR LOGGING JOURNAL DATA USING A LOG WRITE AHEAD DATA SET

Dieter Gawlick, Los Altos; James N. Gray, San Francisco; Wallace M. Iimura, Cupertino, and Ronald L. Obermarck, Los Altos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,485
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—900 **5 Claims**



1. In a system in which data base references are first recorded in a buffer and upon said buffer being filled, transferring its contents to a first log of references and bounding synchronization points of the first (begin transaction) or second types (commit or rollback transaction) stored together with the data base in a nonvolatile memory, a method for data base recovery in the event of system failure, comprising the steps of:

(a) formatting a second log in the memory;

(b) writing data base references into the buffer;

(c) monitoring buffer capacity and the occurrence of synchronization points;

(d) transferring any accumulated buffer contents to the second log when a synchronization point occurs prior to the buffer being filled; and

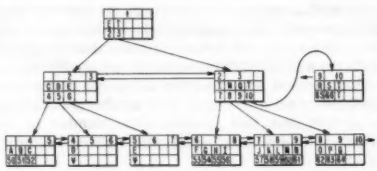
(e) in the event the data base references in the buffer are lost during system failure, redoing or undoing any changes to the data base utilizing the second log, otherwise redoing or undoing any changes utilizing the first log.

4,507,752

IN-PLACE INDEX COMPRESSION

John J. McKenna, Kingston, and John M. Thompson, Lake Katrine, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,815
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **37 Claims**



1. In a data processing system storing a plurality of discrete entities, each identified by a single parameter within a monotonic parameter spectrum, each resident at an addressable location and each locatable by searching a system maintained addresses,

a method of maintaining said multi-level index by said system comprising the steps of:

executing a sequence of processing cycles wherein each

cycle progresses through the index levels in a first and then a second direction, selectively performing at each level of the index, while performing a processing cycle in said first direction, a first subset of basic operation iterations, including,

basic operations for duplicating the presence of an original parameter, and

selectively performing at each level of the index, while performing a processing cycle in said second direction, a second subset of basic operation iterations including,

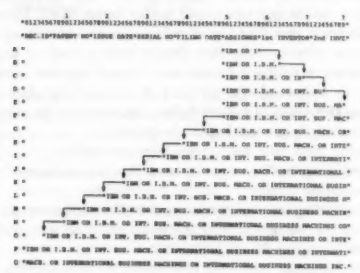
basic operations for deleting the original presence of said duplicated parameter.

4,507,753

METHOD FOR AUTOMATIC FIELD WIDTH EXPANSION IN A TEXT PROCESSING SYSTEM DURING INTERACTIVE ENTRY OF DISPLAYED RECORD SELECTION CRITERIUM

Rex A. McCaskill; John W. McInroy, and Paul D. Waldo, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 264,369, May 18, 1981, abandoned.
This application Feb. 21, 1984, Ser. No. 581,209
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **8 Claims**



1. In a method of interactively entering record selection criterium into an interactive text processing system which employs the same editing process for editing both text type data and spatially related file type data and which also processes spatially related data which is stored in said system as a file of vector formatted records including a header record having a plurality of named fields each having a predetermined number of character positions and a plurality of data records in which the vector format thereof establishes row and column positions of said spatially related data corresponding to said name fields and in which a qualifying frame comprising a header row of said named fields and a predetermined number of qualifying rows is displayed by said system to permit the entry of said criterium interactively by the operator of said said system converting said spatially related data to text type data prior to displaying said spatially related data to said operator system into a selected field of one of said qualifying rows, the improved method which permits entry into said selected field of selection criteria having a total number of character positions greater than said predetermined number of character positions of said selected field, said method comprising the steps of:

(a) displaying a qualifying frame to said operator including a header row and at least one qualifying row, said header row including a plurality of named fields each of which is displayed and each of which has a predetermined number of character positions;

(b) entering selection criteria in a selected one of said fields in said qualifying row;

(c) automatically expanding the displayed width of said selected field in said qualifying row whenever the total number of entered characters exceeds said number of character positions in said selected one field to permit entry of one or more said selection criteria into said one selected field, said step of automatically expanding including the step of:

(d) determining if a predetermined relationship exists between the position of each entered character of selection criteria and the end of said one selected field; and

(e) converting said entered selection criteria into spatially related data

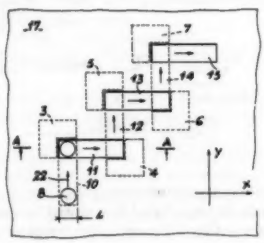
(f) subsequently selecting data records stored in said system in response to an indication that at least one of said converted entered criterium matches the data stored in the corresponding field of each said selected record.

4,507,754

MAGNETIC BUBBLE PROPAGATION DEVICE

Philippe Pougnet, Plaisir, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 25, 1984, Ser. No. 614,442
Claims priority, application France, May 30, 1983, 83 08913
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—19 **4 Claims**



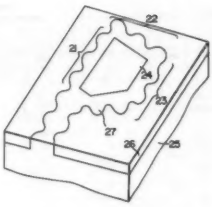
1. A magnetic bubble store having at least one ion implantation magnetic garnet layer, in which are defined patterns corresponding to non-implanted zones of said garnet layer, magnetic bubbles being formable in the garnet layer, on the peripheries of the patterns and an electrically conductive layer superimposed on the garnet layer insulated therefrom and having windows for displacing each bubble from the periphery of one pattern to the periphery of another pattern, wherein the patterns are islands which are separated from one another, said electrically conductive layer having a first conductive coating insulated from the garnet layer by a first insulating layer, said first conductive coating having windows parallel to a first direction in order to respectively displace the bubbles existing between the patterns of the first pairs of patterns arranged parallel to said first direction, said first conductive coating receiving a pulse-type bubble displacement current parallel to the first direction and a second conductive coating superimposed on the first conductive coating and separated therefrom by a second insulating layer, said second conductive coating having windows parallel to a second direction for respectively displacing the bubbles present between the patterns of the second pairs of patterns arranged parallel to said second direction, said second conductive coating receiving a pulse-type bubble displacement current parallel to the second direction, each first pair having a common pattern with each second pair.

4,507,755

MAGNETIC BUBBLE MEMORY DEVICE

Naoki Kodama, Hachioji; Teruaki Takeuchi, Kokubunji; Ryo Suzuki, Kodaira; Masatoshi Takeshita, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,589
Claims priority, application Japan, Nov. 12, 1982, 57-197507
Int. Cl.[3] G11C *19/08*
U.S. Cl. 365—36 7 Claims



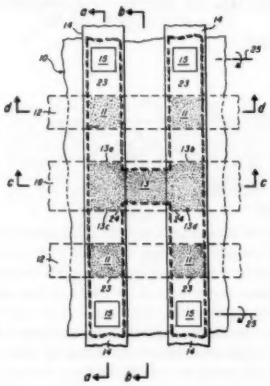
1. A magnetic bubble memory device comprising a magnetic bubble propagation track formed through ion implantation, wherein a first region enclosed by said propagation track and implanted with ions on a condition differing from the condition of ion implantation for forming said bubble propagation track or not implanted with ions at all is provided with a second island-like isolated region formed therein by ion implantation on the same condition as the condition of ion implantation for forming said bubble propagation track.

4,507,756

AVALANCHE FUSE ELEMENT AS PROGRAMMABLE DEVICE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 23, 1982, Ser. No. 361,008
Int. Cl.[3] G11C *17/00*
U.S. Cl. 365—104 10 Claims



1. A programmable semiconductor device comprising: transistor means having a source, a drain, a source-to-drain path and a gate,

a thin dielectric separating the drain from the gate,

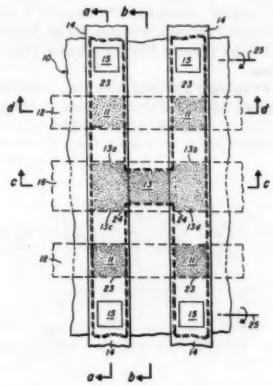
means for applying a high voltage to the drain and a low voltage to the source and gate for selectively breaking down said thin dielectric due to an avalanche-mode current in the source-to-drain path to create an electrical short from drain to gate, the high voltage being less than the dielectric-breakdown voltage of said thin dielectric.

4,507,757

AVALANCHE FUSE ELEMENT IN PROGRAMMABLE MEMORY

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 23, 1982, Ser. No. 361,009
Int. Cl.[3] G11C *17/00*
U.S. Cl. 365—104 23 Claims



1. An electrically programmable semiconductor device comprising:

a transistor having a source-to-drain path and a gate, and means for selectively activating the gate of the transistor for a sense operation, the source-to-drain path connected between a sense node and an access node,

a thin dielectric separating the sense node from a common node,

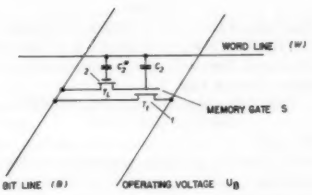
means for applying a high voltage to the sense node for selectively breaking down said dielectric due to an avalanche-mode current in said source-to-drain path to create an electrical short through said dielectric, the high voltage being less than the dielectric-breakdown voltage of said thin dielectric.

4,507,758

SEMICONDUCTOR MEMORY ELEMENT WITH TWO FIELD EFFECT TRANSISTORS

Albrecht Moeschwitzer, Dresden, German Democratic Rep., assignor to VEB Zentrum für Forschung und Technologie Mikroelektronik im VEB Kombinat Mikroelektronik, Dresden, German Democratic Rep.

Filed Jun. 3, 1982, Ser. No. 384,818
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—182 7 Claims



1. A semiconductor memory having a bit line, a word line, an operating voltage line, and a memory cell, said memory cell

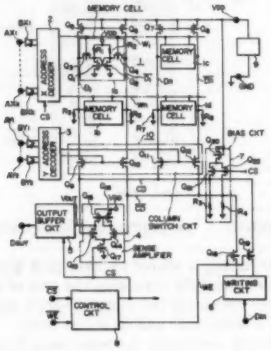
comprising first and second field effect transistors and first and second capacitors coupled between the word line and the gates of the first and second field effect transistors respectively, the drain/source path of the first field effect transistor being connected between the bit line and the gate of the second field effect transistor, and the drain/source path of the second field effect transistor being connected between the bit line and the operating voltage line.

4,507,759

STATIC MEMORY

Tokumasa Yasui; Hideaki Nakamura, both of Kodaira; Kiyofumi Uchibori, Hachiohji; Nobuyoshi Tanimura, Musashino, and Osamu Minato, Kodaira, all of Japan, assignors to Hitachi, Ltd and Hitachi Microcomputer Eng. Ltd., both of Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,590
Claims priority, application Japan, Feb. 2, 1981, 56-12960
Int. Cl.³ G11C *7/02*
U.S. Cl. 365—189 **18 Claims**



1. A static memory comprising:
a static memory cell which has a selection terminal and a data terminal,
a signal line which is supplied with a data signal delivered from said static memory cell,
a sense amplifier which is supplied with said data signal through said signal line,
a bias circuit connected between a power source line and said signal line which includes a MOSFET for applying a bias voltage to said signal line, said bias voltage having a value lowered with respect to a power source voltage fet to said power source line, and
resistance means for coupling a current, of a value substantially equal to or somewhat greater than the leakage current developed by said MOSFET, between said MOSFET and a reference potential point of the circuitry.

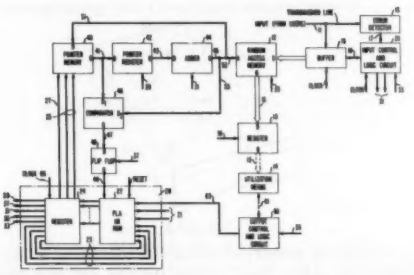
4,507,760

FIRST-IN, FIRST-OUT (FIFO) MEMORY CONFIGURATION FOR QUEUE STORAGE

Alexander G. Fraser, Bernardsville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 13, 1982, Ser. No. 407,877
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—221 **4 Claims**

1. A first-in, first-out memory system for multiword messages comprising:
an addressable cyclic memory
a W pointer register for writing words into said memory at the address of the W pointer,
an R pointer register for reading words from said memory at the address of the R pointer,
an L pointer register for identifying the last work of a multiword message,
means for incrementing the W pointer register, and comparing the W pointer register to the R pointer register before storing a new message word and only if the incremented W pointer and the R pointer are not the same,
means for comparing the contents of the R pointer register



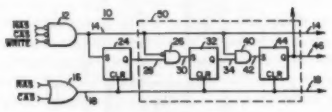
with the contents of the L pointer register, and incrementing the R pointer register and reading the memory word addressed by the R pointer register only if the R and L pointers are not the same,
means responsive to an end of message signal for copying the contents of the W pointer register into the L pointer register, and
means responsive to an error in a new memory word for copying the contents of the L pointer register into the W pointer register.

4,507,761

FUNCTIONAL COMMAND FOR SEMICONDUCTOR MEMORY

Andrew C. Graham, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Apr. 20, 1982, Ser. No. 370,172
Int. Cl.³ G11C *7/00*
U.S. Cl. 365—230 **5 Claims**

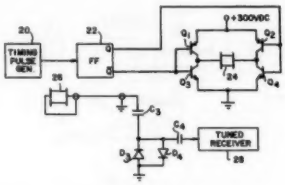


1. A method of initiating a selected functional mode for a memory circuit which receives a plurality of defined operational signals, each of said operational signals occuring within defined time limits with respect to each of the other operational signals for controlling data transfer to and from said memory circuit, the method comprising the steps of:
applying an active state of at least a first of said operational signals to said memory circuit, and
applying an active state of a second of said operational signals to said memory circuit, the timing of said second operational signal relative to said first operation signal occurring outside of said defined timed limits with respect to said first and said second operational signals for controlling data transfer to and from said memory, said step of applying an active state of said second operational signal initiating said selected functional mode for said memory circuit.

4,507,762
METHOD AND APPARATUS FOR GENERATING MONOPULSE ULTRASONIC SIGNALS

Raymond A. Meyer; Frederick S. Howard, both of Thousand Oaks, Calif., and John E. Brugger, Hightstown, N.J., assignors to The United States of America as represented by the Administrator Environmental Protection Agency, Washington, D.C.

Filed Sep. 24, 1982, Ser. No. 422,941
Int. Cl.³ G10K *11/00*; G01S *7/52*
U.S. Cl. 367—137 **5 Claims**

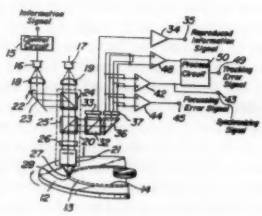


1. A method for generating monopulse ultrasonic signals from a piezoelectric transducer comprising the steps of applying a dc voltage to stress said transducer to substantially its limit and holding that voltage until the next monopulse to be generated, and for each monopulse ultrasonic signal to be generated reversing the polarity of said dc voltage applied to said transducer from one polarity to the other, and holding that reverse polarity voltage until the next monopulse to be generated, whereby a monopulse of half sinewave is transmitted each time the polarity of said voltage is reversed to switch the stress in said transducer from one polarity to an opposite polarity.

4,507,763
OPTICAL INFORMATION RECORDING AND/OR REPRODUCING APPARATUS AND OPTICAL RECORD MEDIUM FOR USE IN SUCH APPARATUS

Kiichi Kato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jan. 28, 1982, Ser. No. 343,479
Claims priority, application Japan, Feb. 5, 1981, 55-14914
Int. Cl.³ H04N *5/76*, *7/00*
U.S. Cl. 369—44 **24 Claims**



1. An apparatus for optically recording an information signal along concentric or spiral information tracks on a record medium in an optical readable form by projecting a recording light beam having an intensity modulated in accordance with an information signal being recorded, the apparatus comprising:

means for rotating a record medium wherein said record medium has a recording surface which is divided into a plurality of concentric recording regions by a plurality of concentric guide tracks which are recorded in an optically readable form to define boundaries between successive ones of said recording regions, each of said concentric recording regions being configured such that a plurality of information tracks may be formed therein;

means for generating a tracking light beam for reading said guide tracks;

means for focusing the tracking light beam onto said guide tracks;

means for detecting a tracking error representing a deviation of the tracking light beam with respect to a selected guide track for producing a tracking error signal;

first controlling means responsive to said tracking error signal for controlling the tracking light beam so that it follows said selected guide track during recording in a recording region associated with said selected guide track;

means for emitting a recording light beam modulated in accordance with an information signal to be recorded;

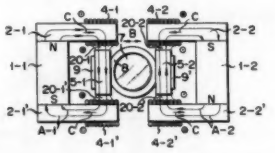
means for focusing the modulated recording light beam onto the record medium; and

second controlling means for controlling the recording light beam with reference to a position of said selected guide track to form a plurality of concentric or spiral information tracks in the recording region associated with said selected guide track.

4,507,764
OBJECTIVE LENS DRIVE DEVICE WITH TRACKING ERROR CORRECTION WITH FLUX OF OPPOSITE DIRECTION

Tohru Musha, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,112
Int. Cl.³ G11B *7/12*; G02B *7/02*, *7/11*
U.S. Cl. 369—45 **8 Claims**



1. In an objective lens drive device for driving an objective lens to correct a tracking error between a data track on a recording medium on which data is spirally or coaxially recorded and a readout spot which is projected on the recording medium by way of the objective lens,

the improvement comprising;

an objective lens drive means at respective opposite sides of said objective lens for flanking said objective lens in the direction of displacement of said objective lens, said objective lens drive means including:

objective lens supporting means at respective opposite sides of said objective lens and which are bent perpendicularly to the optical axis of said objective lens and said data track and which displaceably support said objective lens in said perpendicular direction,

movable members including magnetic bodies at respective opposite sides of said objective lens, said movable members being associated with a respective supporting means and being movable with said objective lens,

first and second stationary yokes which oppose each other and which flank respective movable members perpendicularly to the direction of displacement of said objective lens,

first and second coils which are wound around said first and second stationary yokes, respectively, and

means for generating a magnetic field passing through said first and second stationary yokes and said movable members such that the direction of magnetic flux passing through one of said movable members is opposite to

that of the magnetic flux passing through the other of said movable members;

the elements of said objective lens drive means being arranged so that the distribution of the magnetic field of said objective lens drive means is symmetrical about the optical axis of said objective lens; and

a source of current, corresponding to a tracking error signal which represents the relative misalignment, coupled to said first and second coils of said objective lens drive means,

whereby the movable members which include said magnetic bodies and said objective lens are displaced perpendicularly to the optical axis and said data track to perform tracking error correction.

4,507,765

OPTICAL TRACK SCANNER

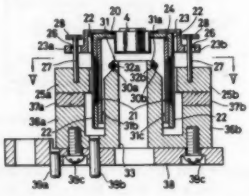
Junichi Suzuki; Keiji Maruta; Kazutaka Noborimoto, and Satoshi Hineno, all of c/o Sony Corporation, 7-35 Kitashinagawa, 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,669

Claims priority, application Japan, Apr. 20, 1981, 56-60432

Int. Cl.³ G11B 7/00

U.S. Cl. 369—45 **11 Claims**



1. In an apparatus directing a light beam against a record medium surface for optically reading information recorded in a track on such surface; an optical scanning assembly comprising lens means interposed in the path of said light beam with an optical axis of said lens means coinciding substantially with said path of the light beam therethrough, lens holding means including a first member having said lens means mounted therein and a second member supporting said first member for rectilinear sliding movement relative thereto in a first direction, base means supporting said second member of the lens holding means for rectilinear sliding movement relative thereto in a second direction at right angles to said first direction, said base means being disposed in respect to the record medium surface so that one of said first and second directions is parallel to said optical axis, first and second coil means mounted on said lens holding means and being independently energizable, and magnetic means for producing magnetic flux in linking relation to said first and second coil means which are oriented so that energizing of one of said coil means is controllable for effecting movement of said lens means relative to said base means in said one direction and thereby focusing said light beam at said record medium surface and energizing of the other of said coil means is controllable for effecting movement of said lens means relative to said base means in the other of said first and second directions.

4,507,766

OPTICAL DEVICE FOR OPTICALLY RECORDING AND REPRODUCING INFORMATION SIGNALS ON AN INFORMATION CARRIER

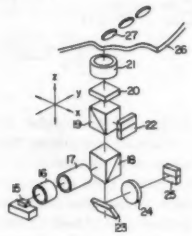
Tetsuo Saimi, Hirakata, and Keiichi Yoshizumi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 12, 1982, Ser. No. 397,451

Claims priority, application Japan, Jul. 16, 1981, 56-112472

Int. Cl.³ G11B 7/12

U.S. Cl. 369—45 **5 Claims**



1. An optical device for irradiating a parallel light beam from a light beam source onto an information carrier and receiving a reflected light beam from said information carrier so as to optically record and reproduce signals on said information carrier, including:

a stationary optical system for guiding said parallel light beam from said light beam source along a first optical axis and deflecting said light beam along said first optical axis so as to redirect said light beam along a second optical axis; and

a movable optical system carrying out at least a two-dimensional movement, for irradiating said light beam from said stationary optical system along said optical axis onto said information carrier, and receiving said reflected light beam so as to guide the latter along said second optical axis and as well to deflect said reflected light in part to redirect the same along a third optical axis;

said stationary optical system comprising: a first beam splitter for deflecting said light beam along said first optical axis so as to redirect said light beam along said second optical axis and to allowing said reflected light beam along said second optical axis to pass therethrough and reach a first photodetector; and said movable optical system comprising: a second beam splitter for allowing said light beam from said first beam splitter and said reflected light beam from said information carrier to pass therethrough along said second optical axis, and deflecting said reflected light beam from said information carrier so as to redirect said reflected light beam in part along a third optical axis to a second photodetector disposed proximate to said second beam splitter, and an objective lens for focussing said light beam from said second beam splitter along said second optical axis onto said information carrier and guiding said reflected light beam from said information carrier along said second optical axis, to said second beam splitter.

4,507,767
CONTROL CIRCUIT FOR CONTROLLING LIGHT SOURCE IN OPTICAL DISC DEVICE

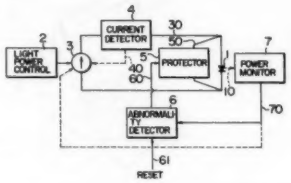
Wasao Takasugi, Higashiyamato, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,293

Claims priority, application Japan, Jan. 6, 1982, 57-337; Mar. 19, 1982, 57-42756

Int. Cl.³ G11B *7/00, 27/36*

U.S. Cl. 369—54 **3 Claims**



1. A control circuit for controlling a light source in an optical disc device in which a semiconductor laser is used as said light source and the light output of said semiconductor laser is made different between an information recording period for recording information on a predetermined recording medium and an information reproducing period therefrom, said control circuit comprising:

means for obtaining a monitor signal corresponding to the light output of said semiconductor laser;

abnormality detecting means for detecting that said monitor signal exceeds a predetermined value; and

protection means connected in parallel with said semiconductor laser, said protection means being put in a short-circuited state between two terminals thereof by the output of said abnormality detecting means.

4,507,768
AUTOMATIC DISC LOADING AND UNLOADING SYSTEM FOR RECORDING-DISC PLAYBACK APPARATUS

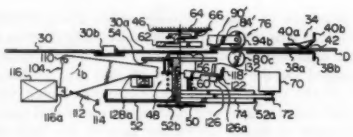
Yuji Ikedo; Kunio Abe, and Masatsugu Saito, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,225

Claims priority, application Japan, Feb. 15, 1980, 55-17543; Feb. 15, 1980, 55-17549

Int. Cl.³ G11B *1/00, 17/04*

U.S. Cl. 369—77.1 **21 Claims**



1. An automatic disc loading and unloading system of an audio and/or video recording-disc playback apparatus including a casing structure having a front wall portion formed with a laterally elongated opening and a support structure positioned within the casing structure, the system comprising elastic support elements having said support structure elastically supported by and within said casing structure through the elastic support elements, a disc support assembly positioned on the support structure and including a turntable structure rotatable about a vertical axis fixed with respect to the support structure, a disc transfer mechanism supported on the support structure and positioned partially intermediate between said disc support assembly and said front wall portion, the disc transfer mechanism being operative to drive a recording disc between the disc support assembly and said front wall portion, and a disc guide structure supported on said support structure and partially located between said front wall portion and said disc support assembly, said disc guide structure partially projecting outwardly from said front wall portion through said elongated opening substantially without being contacted at least in vertical direction by said front wall portion.

4,507,769
DISC REPRODUCING APPARATUS

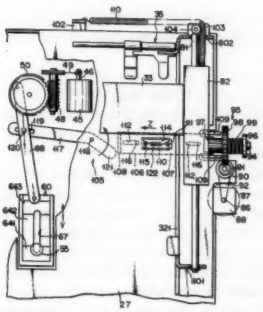
Akira Fukumitsu, and Shigetoshi Sagara, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 26, 1982, Ser. No. 401,712

Claims priority, application Japan, Jul. 29, 1981, 56-118753

Int. Cl.³ G11B *21/02, 9/06, 23/04*

U.S. Cl. 369—77.2 **9 Claims**



1. An apparatus having reproducing and non-reproducing conditions for reproducing signals recorded on a disc while in the reproducing condition, said apparatus comprising:

a turntable rotatably supporting the disc;

a cartridge movable between a reproduction start position and a reproduction end position;

first driving means for moving said cartridge from the reproduction start position to the reproduction end postion by a driving force thereof;

clutch means operatively interconnecting said cartridge and said first driving means and movable between engaged and disengaged positions respectively corresponding to the reproducing and nonreproducing conditions of the apparatus, said clutch means for (a) transmitting the driving force of said first driving means to said cartridge when said clutch means is in said engaged position to responsively move said cartridge in a reproducing direction between said reproduction start and reproduction end positions and (b) releasing said cartridge from the driving force of said first driving means when said clutch means is in said disengaged position to permit said cartridge to return to said reproduction start position; and

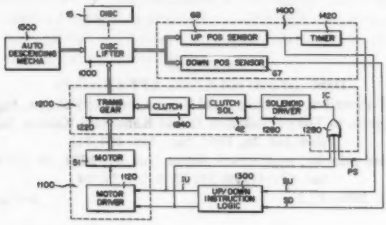
first urging means operatively connected to said cartridge and said clutch means for urging said cartridge in a direction, opposite to said reproducing direction, towards said reproduction start position to move said cartridge into said reproduction start postion in response to said clutch means being moved into said disengaged position, and for holding said cartridge in the reproduction start position while said clutch means is in said disengaged position corresponding to the nonreproducing condition of the apparatus.

4,507,770

CONTROL SYSTEM FOR A DISC PLAYER APPARATUS

Toshio Tanaka, Gunma, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 8, 1982, Ser. No. 416,068
Claims priority, application Japan, Sep. 11, 1981, 56-135223[U]
Int. Cl.³ G11B *1/00, 25/04*
U.S. Cl. 369—77.2 12 Claims



1. A control system for a disc player apparatus comprising:

lifter means for ascending a disc placed thereon to an upper position;

power means for generating drive power for effecting the ascending of said lifter means;

transmission means coupled to said lifter means and to said power means for transmitting said drive power to said lifter means;

instruction means operatively coupled to said power means and said transmission means to supply said power means and said transmission means with an instruction signal, said power means generating said drive power in response to being supplied with said instruction signal;

sensor means coupled to said lifter means for providing said transmission means with a position signal for a predetermined period of time when said lifter means reaches said upper position, said transmission means transmitting said drive power to said lifter means in response to being provided with at least said position signal or said instruction signal and stopping the transmission of said drive power when said position and instruction signals are not provided; and

means coupled to said lifter means for descending said disc to a lower position in response to said transmission means stopping the transmission of said drive power.

4,507,771

MOTOR DRIVE APPARATUS

Toshio Tanaka, Gunma, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 20, 1983, Ser. No. 496,567
Claims priority, application Japan, May 27, 1982, 57-90071
Int. Cl.³ G11B *3/36, 17/04*
U.S. Cl. 369—77.2 5 Claims

1. A motor drive apparatus for a disc player which includes a pickup, a pickup shift mechanism for shifting a position of said pickup and an automatic loading mechanism for loading a jacketed disc into said disc player said motor drive apparatus comprising:

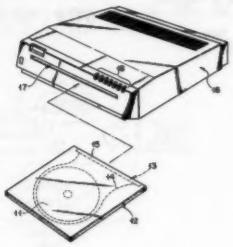
a single motor for providing power, at different times, to said pickup shift mechanism and automatic loading mechanism;

servo control means for servo-controlling the rotation of said motor as a function of the position of said pickup;

position sensor means, coupled to said automatic loading mechanism, for sensing the position of a jacket of said jacketed disc;

actuation control means, coupled to said position sensor means, for controlling the rotation of said motor according to the position of said jacket so that automatic loading of said jacketed disc is performed; and

mode instruction means for selectively connecting either said servo control means or actuation control means to said motor, said pickup shift mechanism, servo control means and motor constituting a tracking servo control



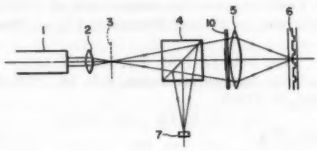
loop which operates when said mode instruction means connects said servo control means to said motor, and said automatic loading mechanism, position sensor means, actuation control means and motor constituting an actuation control loop which enables the automatic loading of the jacketed disc when said mode instruction means connects said actuation control means to said motor.

4,507,772

PLAYBACK OPTICAL SYSTEM FOR VIDEO DISCS

Kimiaki Yamamoto, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 235,988, Feb. 19, 1981, abandoned.
This application May 4, 1983, Ser. No. 489,397
Claims priority, application Japan, Feb. 20, 1980, 55-19237
Int. Cl.³ G11B *7/12*
U.S. Cl. 369—109 3 Claims



1. A playback optical system for video discs comprising a light source, a lens system for condensing a light beam emitted from said light source on the disc surface, a light shield member arranged on the optical axis of said lens system in the vicinity of the pupil of said lens system between said light source and disc surface and having a light shield part at the center thereof to shield the center part of the light beam to advance from said light source to said disc surface through said lens system and a detector for receiving the light reflected on said disc surface through said lens system.

4,507,773

HIGH EFFICIENCY PRECISION LASER BEAM SWITCH

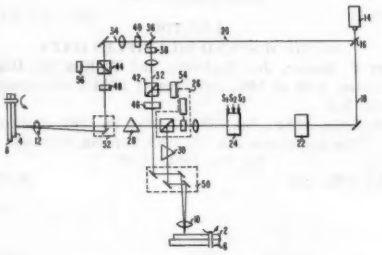
James T. McCann, Collingswood; Lawrence W. Dobbins, Woodlynne, and Charles W. Reno, Cherry Hill, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,089
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—110 4 Claims

1. In a multiple beam optical data processing system for use in recording or retrieving information recorded in tracks,

wherein said system includes first and second turntables for recording information in a near-continuous operation, a source of information signals provides a first stream of continuous data, an apparatus comprising a light beam modulated with said information signals, and switch means for switching said light beam from said first turntable to said second turntable to effect near-continuous recording; wherein said means for switching includes:

polarizing means for effecting a polarization change of said light beam;



actuator means for linearly moving said polarizing means to move said polarizing means in a linear manner such that said polarizing means is positioned in first and second positions, being positioned in said light beam path and out of said light beam path; and

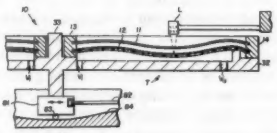
directing means for directing said light beam in first and second directions such that said light beam follows a first predetermined path when said polarizing means is in said first position and follows a second predetermined path when said actuator means is in said second position.

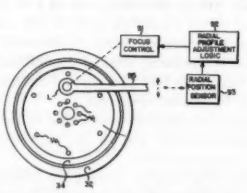
4,507,774

OPTICAL DISC AND DISC-TURNTABLE AIR FLOW INTERFACE ASSEMBLY

Alan B. Marchant, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,397
Int. Cl.[3] G01D *15/32;* **G11B** *5/52*
U.S. Cl. 369—271 **17 Claims**





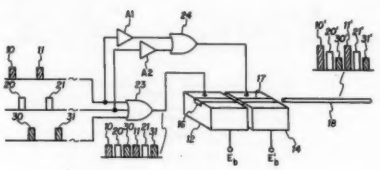
1. An optical disc write/read system of the type comprising: (a) an optical disc unit including a flexible record disc having an annular record zone, and (b) a turntable for receiving such disc unit in a manner forming: (i) a barrier to air-flow at a radially outer interface between said turntable and said flexible disc record and (ii) a generally enclosed space between portions of said turntable and the disc record zone, characterized in that said system includes radially inner and outer ventilation means constructed and located for allowing a continuous, controlled air-flow radially outwardly through said space during rotation of said turntable.

4,507,775

OPTICAL TRANSMITTER WITH LIGHT SOURCE AND OPTICAL AMPLIFIER COMBINATION

Sang K. Sheem, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 27, 1983, Ser. No. 507,876
Int. Cl.[3] H04J *7/00;* **H04B** *9/00*
U.S. Cl. 370—4 **1 Claim**



1. A transmitter for fiber optics communication, comprising:

a solid state light source device biased to emit light;

a solid state optical amplifier device positioned adjacent said source device so as to receive the emitted light at a first power level and to emit output light at a second, greater power level;

means for modulating said source device with digital inputs time multiplexed from a plurality of information channels; and

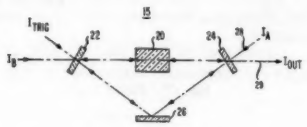
means for providing a modulation current to said amplifier device, including means, synchronized with respect to said multiplexed information channel inputs, for amplifying light levels corresponding to said different information channels by different amounts, thereby to facilitate demultiplexing by a receiver.

4,507,776

NONLINEAR ALL-OPTICAL TIME DIVISION MULTIPLEXER AND DEMULTIPLEXER

Peter W. Smith, Colts Neck, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 12, 1983, Ser. No. 531,500
Int. Cl.[3] H04B *9/00*
U.S. Cl. 370—4 **12 Claims**



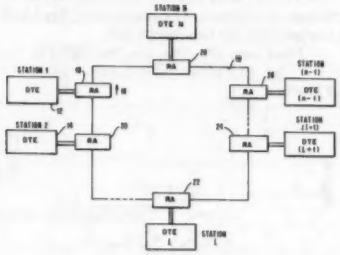
1. An all optical switching element comprising nonlinear optical means including a nonlinear material with a refractive index of the form $n(I)=n_o+n_2I$, where n_o is a constant refractive index and I is the intensity of an optical pulse within said nonlinear optical means, said nonlinear optical means responsive to a first and a second optical pulse stream and an optical trigger pulse stream for switching between said first and said second optical pulse streams as a function of the presence or absence of said trigger pulse stream in said nonlinear optical means.

4,507,777

PROTOCOL FOR DETERMINING PHYSICAL ORDER OF ACTIVE STATIONS ON A TOKEN RING

Edwin L. Tucker, Raleigh; Richard H. Waller, III, Chapel Hill, and Kenneth T. Wilson, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.J.

Filed Feb. 3, 1983, Ser. No. 463,470
Int. Cl.³ H04J 1/16, 3/14, 3/00
U.S. Cl. 370—16 11 Claims



1. A method for determining the identity of a next active upstream station (NAUN) in a reconfigurable serial ring network system having a plurality of ports for accepting and supplying messages to a plurality of mobile stations adapted for connection to any of said ports comprising the steps of:

(a) periodically transmitting to all stations (broadcasts) from one of said ports a message having a first unique command, the identity of the source of the message, and an indicia having at least two states;

(b) at each active station, recognizing the unique command and examining the state of the indicia;

(c) at each active station, storing the identify of the source only if the indicia is in a first state;

(d) at each active station, changing the indicia to a second state for messages whose source identity is being copied;

(e) transmitting a second message which is substantially the same as said first message, including the identity of the transmitting station, a second unique command and an indicia in said first state;

(f) at each active station, recognizing the second unique command and examining the state of the indicia; and

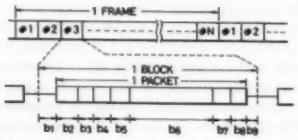
(g) successively repeating at the serially connected active ring stations steps (c) through (f) until an initiating station receives the second message with the indicia in said first state thereby indicating that all active stations on the ring network system have received the identity of the next active upstream station.

4,507,778

DIGITAL TRANSMISSION SYSTEM

Yoichi Tan, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,717
Claims priority, application Japan, Oct. 30, 1981, 56-172896
Int. Cl.³ H04J 3/00
U.S. Cl. 370—94 10 Claims



1. A digital signal transmission system for a multistation communication network of the type wherein digital signals are transmitted over a communication cable between stations in a time division multiplex mode in successive frames with each frame comprising a plurality of blocks, packets of digital signals from each station being arranged in respective blocks, said digital signal transmission system comprising:

means at a first of said stations for transmitting at least one calling packet onto said communication cable addressed to a second of said stations;

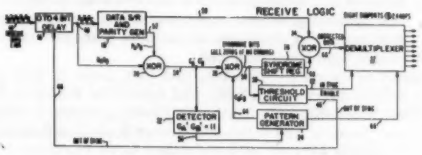
means at said first station for reserving at least a designated one of said blocks for use by said second station in transmitting at least one answer packet to said first station.

4,507,779

MEDIUM SPEED MULTIPLES DATA

Robert P. Barner, Jr., Rockville, and William M. Durham, Wheaton, both of Md., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 265,002, May 19, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,960
Int. Cl.³ H04J 3/06
U.S. Cl. 370—100 20 Claims



12. A synchronizer in a data transmission system for a binary bit stream divided into successive groups of N data bits with a time division multiplexer at a transmitting node having L input ports and outputting L groups of N data bits each to a first parity generator which generates M first parity bits for each N bit group, yielding L groups of M+N bits for each frame, and thus not comprising any additional independent synchronization bits, with a corresponding second parity generator and demultiplexer at the receiving node, and further comprising:

a first pattern generator in the transmitting node which generates first L groups of M pattern bits each frame with a unique group of M pattern bits being generated synchronously with the beginning of each frame, said groups of M pattern bits being logically combined with respective M bit groups of said first parity bits, in a first exclusive OR circuit, yielding M first code bits appended to said N data bits in each group producing an M+N group which is transmitted to the receiving node where said second parity generator generates from N assumed data bits, M second parity bits being logically combined with the assumed M first code bits, in a second exclusive OR circuit to produce M second code bits;

a unique pattern bit detector connected to the output of said second exclusive OR circuit for detecting said unique groups of M pattern bits;

a second pattern generator having an enabling input connected to the output of said detector for commencing the generation of second L groups of M pattern bits being equal to said first groups, upon the detection of said unique groups of M pattern bits;

a third exclusive OR circuit having a first input connected to the output of said second exclusive OR circuit and a second input connected to the output of said second pattern generator for generating syndrome bits whose values are

zero if the data bits are received correctly and in synchronization;

and a digital shifter, at the output of the receiving node, being controlled by non-zero syndrome bits to establish synchronization between the transmitted and the received data bits.

4,507,780

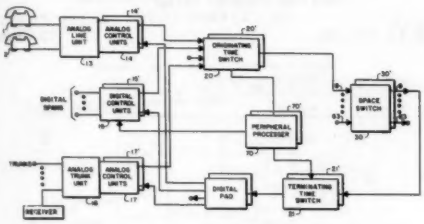
DIGITAL SPAN FRAME DETECTION CIRCUIT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,571

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—100 **11 Claims**



1. In a telecommunications switching system having a switching network, a plurality of digital spans connected to said switching network and each said digital span asynchronously transmitting PCM data to said switching network, a digital span frame detection circuit connected between each said digital span and said switching network for detecting a loss of proper framing for any of said digital spans, said digital span frame detection circuit comprising:

monitor means connected to each said digital span and being operated to produce a frame check signal for detection of an S-bit of any one particular digital span;

first means for addressing connected to said switching network and to said monitor means, said first means for addressing being operated in response to said frame check signal to collect and transmit a first address;

first memory means connected to said first means for addressing and being operated in response to said first address to transmit a data word representing an error status said one particular digital span, indicated by said first address;

second means for addressing connected to said first memory means and being operated to transmit a second address in response to said error status word;

second memory means connected to said second means for addressing and being operated in response to said second address, including at least three bits equal to a predefined value, to produce an error signal of a first value or alternatively to produce an error signal of a second value;

said first memory means connected to said second means for addressing and being further operated to store said address for said one particular digital span;

said monitor means connected to said second memory means and being operated in response to said error signal of a first value to produce an alarm signal for said one particular digital span, said monitor means being further operated in response to said error signal of a second value to inhibit production of said alarm signal;

latching means connected to said monitor means and being operated to store an indication representing said alarm signal for each of said digital span; and

means for scanning connected to said monitor means and to said latching means, said means for scanning being operated to examine said stored alarm signals for each said digital span and said means for scanning being further operated to produce a plurality of output signals for identifying one said digital span, having a corresponding alarm signal indicating loss of framing.

4,507,781

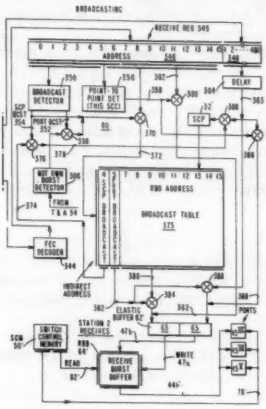
TIME DOMAIN MULTIPLE ACCESS BROADCASTING, MULTIPOINT, AND CONFERENCING COMMUNICATION APPARATUS AND METHOD

Joseph A. Alvarez, III, Damascus; John F. Brennen, Gaithersburg; Robert W. Krug, Rockville; Bruce D. Gobioff, Silver Spring, and John Shabe, Darnestown, all of Md., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 297,596, Aug. 31, 1981, abandoned, which is a continuation of Ser. No. 130,498, Mar. 14, 1980, abandoned. This application Sep. 16, 1983, Ser. No. 533,035

Int. Cl.³ G06F *3/04;* **H04M** *3/56;* **H04J** *3/16;* **H04Q** *11/04*

U.S. Cl. 370—104 **13 Claims**



12. A TDMA communications broadcasting system having a plurality of input/output ports at a first station for transferring a plurality of data units per TDMA frame from respective, local data users to a TDMA communication link, with a first port transmitting a point-to-point message and a second port transmitting a broadcast message, and having a plurality of input/output ports at a second station for transferring said data from said TDMA communication link to respective local users on a time interleaved basis during periodic TDMA frames, with a third port receiving said point-to-point message and a plurality of fourth ports receiving said broadcast message, comprising:

a transmit buffer at said first station having a data input connected to a transmit bus common to the data outputs of said first and second ports and a data output connected to said TDMA communication link, for storing first data from said first port and second data from said second port;

a transmit signaling buffer at said first station having an output connected to said TDMA communication link, for storing a direct destination address corresponding to said first data from said first port to be transmitted point-to-point and for storing an indirect destination address corresponding to second data from said second port to be transmitted in broadcast mode;

a transmit mechanism at said first station having an output connected to an input to said transmit buffer and also connected to an input to said transmit signaling buffer, for accessing said transmit buffer and said transmit signaling buffer, to transmit said direct address with said first data and to transmit said indirect address with said second data over said TDMA communication link;

a detector at said second station having an input connected to said TDMA communication link, for detecting said direct destination address and outputting a first control

signal and for detecting said indirect destination address and outputting a second control signal;

a receive buffer in said station having an address input gatably connected by said first control signal to said TDMA communication link, a data input connected to said link and a data output connected to a receive bus common to the data inputs of said third and fourth ports, with two addressable storage locations, for storing said first data at a first of said locations accessed by said direct destination address;

said third port having an input connected to said first location in said receive buffer, for receiving said first data in point-to-point communication mode;

a broadcast memory at said second station having an address input gatably connected by said second control signal to said TDMA communication link and an output connected to an address input to said receive buffer, for storing a correlated direct address which is accessed by said indirect destination address;

said broadcast memory outputting said correlated direct address to said receive buffer address input for storing said second data at a second of said locations so accessed;

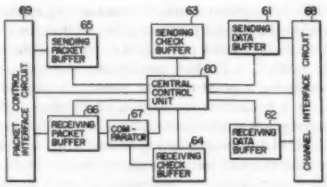
said plurality of fourth ports each having an input connected to said second location in said receive buffer, for receiving said second data in broadcast communication mode;

whereby both broadcast and point-to-point communications can be carried out over said TDMA communication link.

4,507,782
METHOD AND APPARATUS OF PACKET SWITCHING

Koichi Kunimasa, Hadano; Setsuo Futamura, Kanagawa, and Jun Okada, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,416
Claims priority, application Japan, Oct. 16, 1981, 56-164176
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—32 **7 Claims**



6. A packet mode terminal comprising:

a central control unit;

means including a sending data buffer for storing data to be transmitted;

means including a sending check buffer connected to said central control unit for storing check data formed on the basis of said data stored in said sending data buffer by said central control unit;

means including a sending packet buffer connected to said central control unit for storing at least one packet formed from said data stored in said sending data buffer and a packet formed from said check data by said central control unit;

means including a packet control unit for sending on a communication line said packets stored in said sending packet buffer and for receiving a packet from said communication line;

means including a receiving packet buffer for storing packets received by said packet control unit;

means including a receiving data buffer for storing data fetched from said receiving packet buffer by said central control unit;

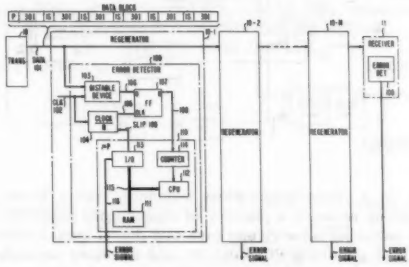
means including a receiving check buffer connected to said central control unit for storing check data formed from received data by said central control unit; and

comparator means operated when said central control unit detects that said receiving packet buffer has received check data for comparing said receiving check data with said check data stored in said receiving check buffer.

4,507,783
ERROR DETECTION CIRCUITRY FOR DIGITAL SYSTEMS

Stewart S. Austin, Morganville; Joseph J. Baldini, III, Lincroft; Joel E. Jakubson, Neptune, and Clarke S. Ryan, Red Bank, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 28, 1983, Ser. No. 470,148
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **10 Claims**



1. Circuitry for detecting errors in a bit stream comprising data and parity bits arranged into a succession of data blocks wherein each block has a bit rate and a given parity, said circuitry comprising

means for toggling between two states solely in response to the occurrence of a predetermined bit value in said bit stream,

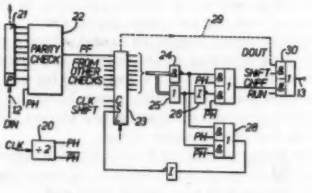
means for sampling the state of said toggle at a submultiple of said bit rate, and

means for comparing said sampled states against a predetermined criterion.

4,507,784
DATA PROCESSING SYSTEMS

Brian J. Procter, Broadbottom, England, assignor to International Computers Limited, London, United Kingdom

Filed May 18, 1983, Ser. No. 495,802
Claims priority, application United Kingdom, May 21, 1982, 8214961
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—61 **12 Claims**



1. A data processing system comprising a plurality of modules, each module comprising:

(a) means for receiving a clock signal for controlling the timing of the module,

(b) checking means for monitoring the operation of the module and producing a failure signal to indicate whether or not the module is operating correctly, and

(c) means responsive to the clock signal for inverting the sense of the failure signal in successive clock periods.

4,507,785
UNPOLARIZED ELECTRO-OPTICALLY Q-SWITCHED LASER

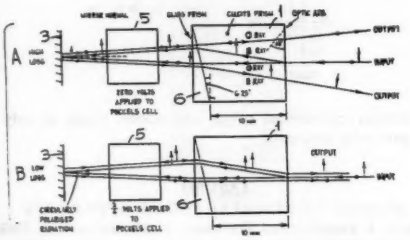
James Richards, Tea Tree Gully, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU82/00043, § 371 Date Nov. 26, 1982, § 102(e) Date Nov. 26, 1982, PCT Pub. No. WO82/03502, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1982, Ser. No. 445,380

Int. Cl.³ H01S 3/11

U.S. Cl. 372—12 **9 Claims**



1. The method of producing a laser beam from a laser rod confined between a partially transmitting mirror and a totally reflecting mirror defining a resonant laser cavity and containing a Pockels cell in laser cavity comprising the steps of: passing the radiation from said laser rod through a birefringent prism element also positioned in the laser cavity said prism element splitting the radiation into orthogonally polarized extraordinary E rays and ordinary O rays which propagate in slightly different directions, resulting in walk-off; and reflecting back the rays along the cavity by said totally reflecting mirror while applying a voltage to the Pockels cell to induce a quarter wave difference between the E rays and O rays to interchange the E rays and the O rays, whereby the walk-off occurring in a first pass through said prism element is cancelled by an equal and opposite walk-off during the return path through prism element so that the beam returning to the laser rod is parallel to the rod axis.

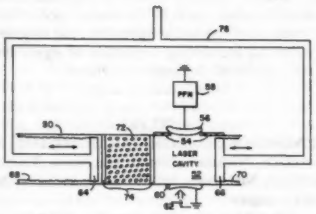
4,507,786
PUSH-PULL PULSED GAS LASER

George J. Dezenberg, and Charles E. Cooper, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1983, Ser. No. 525,374

Int. Cl.³ H01S 3/00

U.S. Cl. 372—33 **4 Claims**



1. In a pulsed gas laser, a housing having a laser cavity therein and a pair of piston means mounted in said housing on opposite sides of said laser cavity for movement back and forth in a push-pull arrangement, a heat exchanger and acoustic suppressor means mounted in said housing relative to said laser cavity, and laser gas media in said housing and filling said laser cavity and the space between said piston means whereby when the laser gas media in said laser cavity is pulsed to form a laser output, said laser gas is heated and produces acoustic waves that must be removed, and said pistons being mounted in said housing such that movement of said pistons in unison in one direction causes the laser gas media in said cavity that has been heated and has acoustic waves therein to be positoned into the heat exchanger and acoustic suppressor means to remove the heat from the laser gas media and to suppress the acoustic waves.

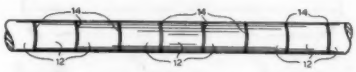
4,507,787
SEGMENTED YAG LASER RODS AND METHODS OF MANUFACTURE

Richard T. Daly; Martin G. Cohen, both of Huntington, N.Y., and Binod Kumar, Centerville, Ohio, assignors to Quantronix Corporation, Smithtown, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,729

Int. Cl.³ H01S 3/03

U.S. Cl. 372—62 **8 Claims**



1. A laser rod, which comprises a plurality of rod segments joined to each other by an optical glass cement, the cement being selected to have its index of refraction and thermal coefficient of expansion matching that of the segments, the cement being non-solarizing and optically linear and non-absorbing at laser wavelengths during laser dynamic conditions, the cement having bond strength capable of withstanding use under static and dynamic conditions and being chemically compatible with the rod segment material.

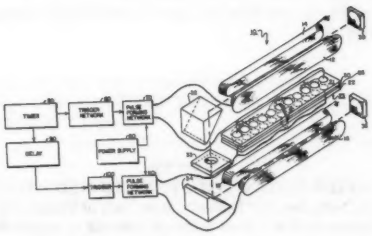
4,507,788
MULTIPLE PULSE TEA LASER

James W. Barnie, Stoughton, and Robert I. Rudko, Holliston, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 317,674, Nov. 2, 1981, abandoned. This application Mar. 29, 1984, Ser. No. 594,435

Int. Cl.³ H01S 3/097

U.S. Cl. 372—83 **18 Claims**



1. In combination:

an optical resonator;

a gain medium disposed in said resonator;

a plurality of discharge regions disposed in said gain medium; and

means for producing a first discharge pulse in a first one of said regions in response to a first control pulse and for producing a second, time delayed, discharge pulse in a second one of said regions in response to a second, time delayed, control pulse, and

wherein said optical resonator includes means, responsive to

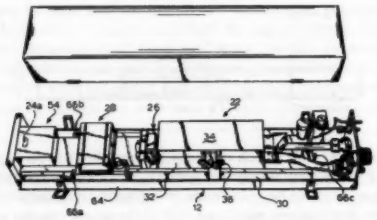
the first and time delayed second discharge pulse, for generating correspondingly time delayed pulses of resonant optical energy in the resonator, such time delayed resonant optical energy pulses being coupled along a common path to an output of the resonator.

4,507,789

YAG LASER SYSTEM

Richard T. Daly, Huntington; Walter Rhoades, Port Jeff Sta; Harvey Stone, Flushing, and Robert A. Kaplan, Huntington Station, all of N.Y., assignors to Quantronix Corporation, Smithtown, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,148
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—92 **16 Claims**



1. A reliable, light weight, low cost YAG laser comprising:
a resonator cavity including a YAG rod and two mirrors, a lamp for exciting the rod, a laser pot comprising a housing containing the rod and lamp, and a detachable cover for the housing and means for connecting said cover to said housing, said pot housing including connection means for detachably connecting the ends of said lamp, said connection means including a conical socket receiving one end of the lamp and a cylindrical socket receiving the other end of the lamp, the cover including light spring means for receiving the lamp while permitting its mounting in the housing on the sockets and for removal therefrom as the cover is removed from the housing;
a power supply means coupled with the resonator for supplying power to the resonator; and
a cooling system coupled with the resonator for cooling the resonator.

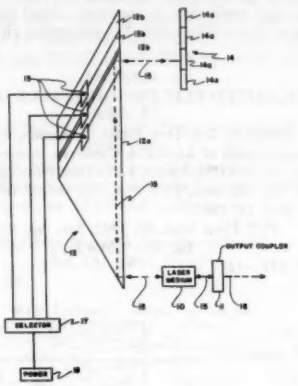
4,507,790

LASER SYSTEM WITH PARTITIONED PRISM

John E. Nettleton, and Dallas N. Barr, both of Woodbridge, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,431
Int. Cl.³ H01S *3/086;* G02B *5/04*
U.S. Cl. 372—100 **5 Claims**

1. A system for choosing a particular spectral line from a multi-line laser, wherein:
said laser includes an optical cavity with a laser medium therein, and said optical cavity is defined in part by an output coupler;
a plurality of frequency-sensitive retroreflectors;
a partitioned prism in said optical cavity for directing a laser beam in said cavity onto a particular one of said retroreflectors, whereby said particular retroreflector further



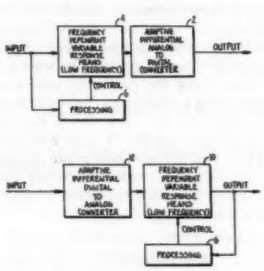
defines said optical cavity and allows lasing at only a particular frequency.

4,507,791

ANALOG AND DIGITAL SIGNAL APPARATUS

Kenneth J. Gundry, San Francisco, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 375,037, May 5, 1982,. This application Sep. 7, 1982, Ser. No. 415,028
Int. Cl.³ H04B *1/62*
U.S. Cl. 375—27 **30 Claims**



1. An audio analog to digital conversion system receiving analog input audio signals comprising adaptive differential modulation analog to digital conversion means, and frequency dependent variable response means for processing said input audio signals prior to their application to said conversion means, the variable response means having characteristics that boost, relative to other parts of the audio spectrum, signals in the lower portion of the audio spectrum, the degree of boosting rising with the increasing amplitude of signal components in the upper portion of the audio spectrum.

4,507,792

PCM ENCODER CONFORMABLE TO THE A-LAW

Kazuo Yamakido, Nishitama; Shiro Hagiwara, Tachikawa, and Fumiaki Fujii, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1983, Ser. No. 476,620
Claims priority, application Japan, Mar. 26, 1982, 57-47203
Int. Cl.³ H04B *12/04;* H03K *13/02*
U.S. Cl. 375—30 **8 Claims**

1. A PCM signal encoder for converting an input analog

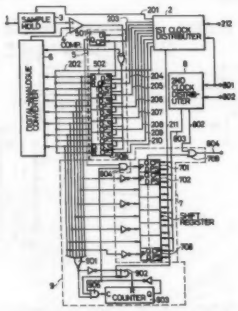
signal into a PCM code signal composed of a polarity bit and a plurality of bits expressive of an amplitude, comprising:

a sample-and-hold circuit which samples and holds an input analog signal;

a digital-to-analog converter;

voltage comparator means for comparing the output of said sample-and-hold circuit and the output of said digital-to-analog converter;

successive approximation register means connected to receive the output of said comparator means for supplying a succession of digital output values to said digital-to-analog converter;



output register means for converting the output code of said successive approximation register means and for supplying the converted code to an output of said encoder as a PCM code signal at a predetermined time;

detection means responsive to said amplitude bits of said PCM code signal for detecting an idle channel state representing a no input signal condition; and

means connected to said detection means for fixing the polarity bit of the PCM code signals in said output register means when the output of said detection means indicates an idle channel state.

4,507,793

DIGITAL SIGNAL TRANSMISSION SYSTEM

Tello D. Adams, Seminole, Fla., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 17, 1982, Ser. No. 450,616

The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.

Int. Cl.³ H04L *5/14*

U.S. Cl. 375—36 **28 Claims**

1. An interface circuit for digital signal transmission system for use between first and second digital signaling devices, each device being operative to provide digital device signals of first, second and third characteristics, said digital signal transmission system comprising:

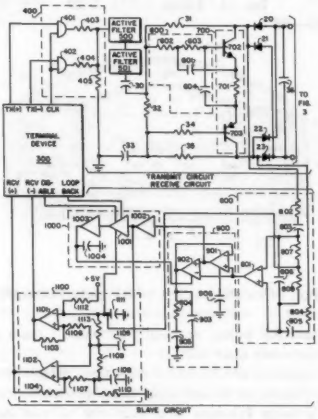
first and second line interface devices connected to said first and second digital signaling devices, respectively;

a transmission line connected between said first and second line interface devices;

each of said first and second line interface devices being operative in response to said digital device signal of said first characteristic to provide bias current in said transmission line; and each being further operative in response to said digital device signals of said second and third characteristics to modulate said bias current with modulation signals of first and second characteristics, respectively;

said transmission line being operative to attenuate and distort said modulation signals of first and second characteristics;

each of said first and second line interface device being further operative to compensate for said transmission line attenuation and distortion and further operative in response to said bias current to provide a digital interface signal of a first characteristic and each being further operative in response to said attentuated and distorted modulation signals of said first and second characteristics to provide digital interface signals of second and third characteristics, respectively;



said digital signaling devices each being further operative to receive said digital interface signals of said first, second and third characteristics.

4,507,794

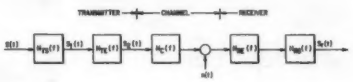
FILTERED MANCHESTER CODED PSK TRANSMISSION SYSTEM

Stephen K. Jones, 2204 Heather Hill, Plano, Tex. 75075, and Donald A. Johnston, 1609 Hartford, Carrollton, Tex. 75007

Filed May 4, 1983, Ser. No. 491,605

Int. Cl.³ H04B *1/12*

U.S. Cl. 375—55 **10 Claims**



1. A method for digital transmission comprising:

coding a binary antipodal data signal into a Manchester Coded PSK format;

passing the coded data through a first transforming network having a transfer function of low pass type;

transmitting the signal output by the first transforming network over a communications channel;

receiving the transmitted data;

passing the received data through a second transforming network having a second transfer function of low pass type to transform the signal into two superimposed raised cosine signals of opposite polarities and shifted in time by the signaling rate thereof;

passing the signal output by the second transforming network through a third transforming network of bandpass type to transform the signal into a quasi-raised cosine signal; and

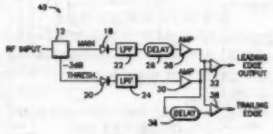
coherently sampling the raised cosine signal to reconstruct the digital data signal.

4,507,795

APPARATUS AND METHOD FOR LOCATING LEADING AND TRAILING EDGES OF RF PULSES

Carl M. Wagner, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1983, Ser. No. 465,981
Int. Cl.³ H03K *5/153, 5/20*
U.S. Cl. 375—95 **7 Claims**



5. A method of locating edges of RF pulses comprising the steps of:

dividing said RF pulses unequally between a main channel and a threshold channel;

applying substantially identical detecting, filtering and amplifying functions to said main and threshold channels;

applying a delay function to a least one of said main and threshold channels; and

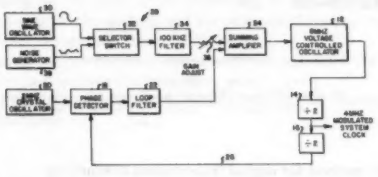
comparing outputs of said main and threshold channel signals and producing a transition when a signal level in said main channel crosses a signal level in said threshold channel.

4,507,796

ELECTRONIC APPARATUS HAVING LOW RADIO FREQUENCY INTERFERENCE FROM SYSTEM CLOCK SIGNAL

David M. Stumfall, Santa Ana, Calif., assignor to Printronix, Inc., Irvine, Calif.

Filed Oct. 20, 1982, Ser. No. 435,400
Int. Cl.³ H04L *7/00;* **H03B** *29/00*
U.S. Cl. 375—106 **5 Claims**



1. Apparatus having low radio frequency interference from a clock signal generator therein comprising:

a base crystal oscillator for providing a base signal of given frequency;

a voltage controlled oscillator for providing a modulated system clock signal having a desired nominal frequency;

a phase detector having a pair or inputs coupled to receive the base signal and the clock signal and an output for providing a phase signal;

means for providing a modulating signal, said means including means for generating a varying signal and a bandpass filter coupled to receive the varying signal and provide the modulating signal;

means for summing the modulating signal and the phase signal to provide a combined signal to the voltage controlled oscillator; and

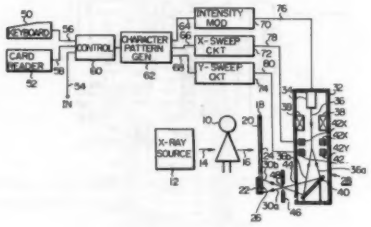
at least one electronic circuit requiring a clock signal of the desired nominal frequency for proper timing, the electronic circuit being coupled to receive the modulated system clock signal.

4,507,797

DATA RECORDING SYSTEM USING STIMULABLE PHOSPHOR

Hisatoyo Kato, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 14, 1982, Ser. No. 434,327
Claims priority, application Japan, Oct. 26, 1981, 56-171185
Int. Cl.³ A61B *6/00*
U.S. Cl. 378—165 **11 Claims**



1. A data recording system wherein a radiation image storage medium including a stimulable phosphor is exposed to a radiation transmitted through an object to store therein a latent image associated with the object, said medium being, afterwards, exposed to a stimulating ray to read out the stored latent image, comprising:

X-ray beam generator means for generating an X-ray beam to a part of the radiation image storage medium;

input means for receiving information associated with an image to be stored in the part of the radiation image storage medium; and

control means connected to said X-ray generator means and input means for controlling the X-ray beam generator means in accordance with the received information;

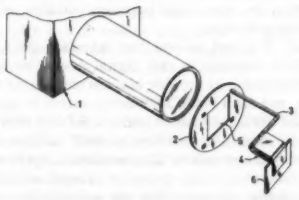
said control means varying the intensity of the X-ray beam in accordance with the received information, and causing the X-ray beam to be directed to the part of the radiation image storage medium, thereby recording the received information in the part of the radiation image storage medium.

4,507,798

DEVICE FOR PERFORMING X-RAY EXAMINATIONS OF THE TEETH

Ulf E. S. Welander, Sofiehemsu 16, 90239, UmeÅ, Sweden

Filed Oct. 15, 1982, Ser. No. 434,628
Claims priority, application Sweden, Nov. 4, 1981, 8106534
Int. Cl.³ A61B *6/14*
U.S. Cl. 378—170 **8 Claims**



1. A device for performing dental X-ray examinations, comprising: a film holder substantially L-shaped in section and having a narrower portion and a thicker portion, said film holder being adapted to receive X-ray film in two alternative

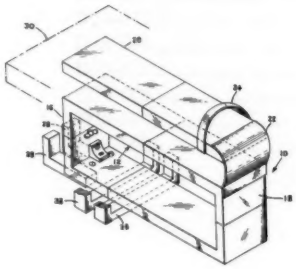
planes relative to the film holder and including a socket in the thicker portion; shielding-off means having a first connecting portion configured complementary to said socket and designed to be connected to said socket; and extension means having a second connecting portion configured complementary to said socket and designed to be connected to said socket, whereby either or both of said shielding-off means and said extension means are connected to said film holder.

4,507,799

X-RAY FILM SUPPORT

John W. Shimkus, 690 Castleton Ave. Apt. 2B, Staten Island, N.Y. 10310

Filed Sep. 30, 1982, Ser. No. 429,226
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—177 **6 Claims**



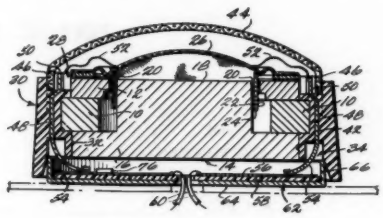
1. An X-ray film support comprising:
a front leg and a back leg;
a lower brace connecting the bottom portion of said front leg with the bottom portion of said back leg;
an upper brace connecting the upper portion of said front leg with the upper portion of said back leg for support of an object to be X-rayed;
sitrrups extending laterally from said lower brace for the support of film cassettes alongside said object for receiving X-rays from an X-ray source;
said legs are of adjustable lengths for aligning the position of said object with said cassette.

4,507,800

ENCLOSED MAGNET LOUDSPEAKER

Michael L. Kelly, Boston, Mass., assignor to Analog & Digital Systems, Inc., Wilmington, Mass.

Filed Jan. 6, 1982, Ser. No. 337,368
Int. Cl.³ H04M *1/04*
U.S. Cl. 381—88 **22 Claims**



1. A loudspeaker comprising:
means for creating vibrations in response to an electrical signal;
a housing attached to and encapsulating at least a portion of said creating means, said housing having a plurality of first grooves extending circumferentially about said housing and axially a first predetermined distance into said housing and a plurality of second grooves, one associated with and contiguous to each of said first grooves and extending circumferentially about said housing, coaxially with said first grooves, said second grooves beginning a second predetermined distance, less than said first predetermined distance, into said housing and extending to said first predetermined distance; and
a mounting plate, said mounting plate including a plurality of vertical members extending into said first grooves and a plurality of horizontal members, each attached to one of said vertical members and extending into said second grooves, each combination of said horizontal and vertical member having a circumferential length less than the circumferential length of said first groove so that said housing may be separated from said mounting plate by rotating said housing and moving said housing normal to said mounting plate.

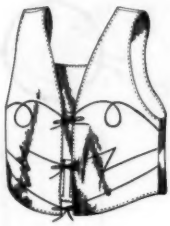
DESIGN PATENTS

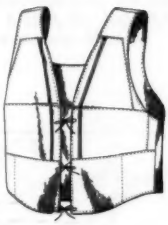
GRANTED MAR. 26, 1985

ERRATA

For CLASS	See PATENT NO.
D21–247	278,177
D23–071	278,178
D23–094	278,179
D23–123	278,180
D24–008	278,181
D24–029	278,182
D24–038	278,183

278,089
REVERSIBLE VEST OR SIMILAR ARTICLE
Barbara W. Day, 2 Starlight Rd., Clarks Summit, Pa. 18411
Filed Nov. 15, 1982, Ser. No. 441,845
Term of patent 14 years
U.S. Cl. D2—190

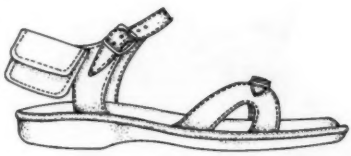




278,090
VEST OR SIMILAR ARTICLE
Joseph C. Cochran, 114 S. Stormont, Princeton, Ind. 47670
Continuation of Ser. No. 360,609, Mar. 22, 1982, abandoned.
This application May 29, 1984, Ser. No. 615,692
Term of patent 14 years
U.S. Cl. D2—190

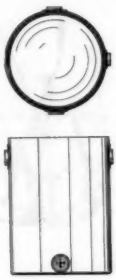
278,091
BOOT
Lorelei Korn, 1657 Colby Ave.; #4, Los Angeles, Calif. 90025
Filed Jul. 12, 1982, Ser. No. 397,508
Term of patent 14 years
U.S. Cl. D2—288

278,092
POCKETED SANDAL
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Dec. 13, 1982, Ser. No. 449,410
Term of patent 14 years
U.S. Cl. D2—296

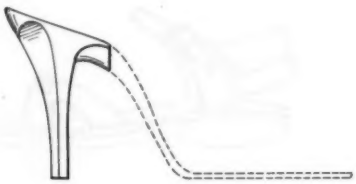


278,093
LOW CUT TENNIS SHOE OR THE LIKE
Noboru Ueda, Chikushino, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jul. 19, 1982, Ser. No. 399,374
Claims priority, application Japan, Dec. 14, 1981, 56-55493
Term of patent 14 years
U.S. Cl. D2—310

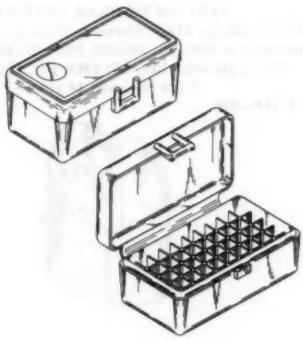
278,095
FLEXIBLE STORAGE CONTAINER FOR ELECTRIC EXTENSION CORDS OR SIMILAR ARTICLES
Russell Werner, Rte. 2, Box 218, Stillwater, Okla. 74074
Filed Nov. 12, 1982, Ser. No. 441,047
Term of patent 14 years
U.S. Cl. D3—30.1



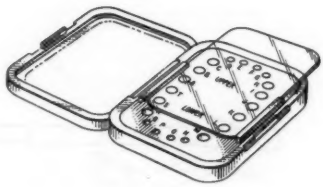
278,094
HEEL PORTION OF A COMBINED HEEL-SHOE UNIT
Agop Rousian, 427 W. Palm Dr., Arcadia, Calif. 91006
Filed Oct. 13, 1981, Ser. No. 310,883
Term of patent 14 years
U.S. Cl. D2—325



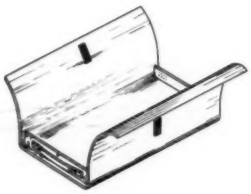
278,096
BULLET CASE
John R. Walker, 12510 Adler Dr., Whittier, Calif. 90606, and Thomas G. Montes, 6616 Lindsey, Pico Rivera, Calif. 90660
Filed Jan. 31, 1983, Ser. No. 462,473
Term of patent 14 years
U.S. Cl. D3—38



278,097
CASE FOR BABY TEETH
Reiko Akiyoshi, 304 Germaine Ave., Santa Cruz, Calif. 95065
Filed Jan. 13, 1983, Ser. No. 439,805
Term of patent 14 years
U.S. Cl. D3—74



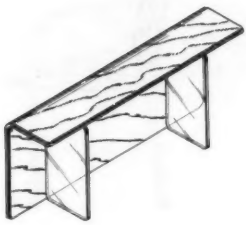
278,098
PACKING INSERT FOR A SUITCASE
Lois Velkas, 5415 Elysian Fields Ave., New Orleans, La. 70112
Filed Jun. 8, 1983, Ser. No. 291,810
Term of patent 14 years
U.S. Cl. D3—99



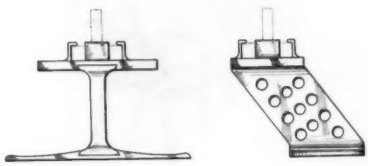
278,099
BLACKTOP APPLICATOR BRUSH AND SQUEEGE COMBINATION
David M. Evans, Cincinnati, Ohio, assignor to Wright-Bernet Incorporated, Hamilton, Ohio
Filed Feb. 25, 1982, Ser. No. 352,192
Term of patent 14 years
U.S. Cl. D4—116

278,100
BRUSH FOR REMOVING CORN SILK
Sarah C. Hughes, 3115 E. 7th St., Anderson, Ind. 46012
Filed Sep. 17, 1982, Ser. No. 419,567
Term of patent 14 years
U.S. Cl. D4—135

278,101
CONVERTIBLE TABLE
Gerald L. McCabe, 1721 W. Washington Blvd., Venice, Calif. 90291
Filed Sep. 30, 1982, Ser. No. 430,702
Term of patent 14 years
U.S. Cl. D6—478



278,102
STAND FOR A HOME VIDEO CONTROLLER
John R. Wagner, Jr., 300 Ashley Dr., Rochester, N.Y. 14620
Filed Sep. 30, 1982, Ser. No. 443,498
Term of patent 14 years
U.S. Cl. D6—466

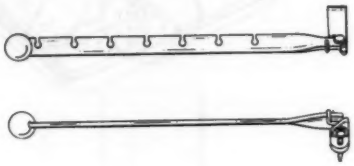


278,103
SOFA
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Mar. 15, 1982, Ser. No. 358,017
The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—381

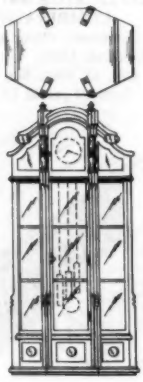
278,104
CHAIR OR SIMILAR ARTICLE
Jack G. Dunbar, New York, N.Y., and Steven Brooks, Greenwich, Conn., assignors to Dunbar Furniture, Inc., Berne, Ind.
Filed Jun. 21, 1982, Ser. No. 390,103
Term of patent 14 years
U.S. Cl. D6—379

278,105
CHAIR
Norman H. Ridenour, 3262 Grape, San Diego, Calif. 92102
Filed Jan. 28, 1983, Ser. No. 461,860
Term of patent 14 years
U.S. Cl. D6—379

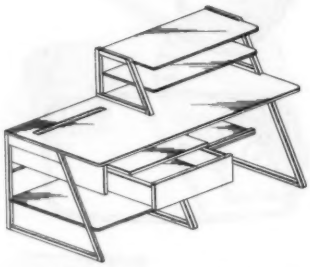
278,106
SHOWER HANGER SUPPORT FOR STANDARD AND HOTEL HANGERS
George G. Green, 8600 NW. La. #52, Stockton, Calif. 94210
Filed May 24, 1982, Ser. No. 381,193
Term of patent 14 years
U.S. Cl. D6—525



278,107
CABINET
Philip P. Fusco, 123-11 149th Ave., South Ozone Park, N.Y. 11420
Filed Jul. 12, 1982, Ser. No. 397,037
Term of patent 14 years
U.S. Cl. D6—471

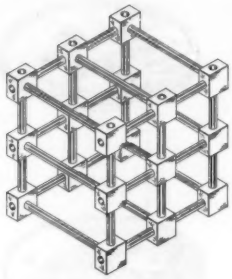


278,108
MODULAR COMPUTER DESK
Ron L. Lyman, and Frank T. Hittell, both of P.O. Box 1282, Fair Oaks, Calif. 95628
Filed Jul. 1, 1982, Ser. No. 394,319
Term of patent 14 years
U.S. Cl. D6—476

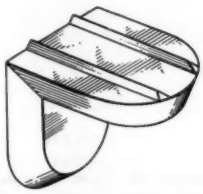


278,109
LITERATURE HOLDER
Douglas B. Leeds, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Aug. 19, 1982, Ser. No. 409,571
Term of patent 14 years
U.S. Cl. D6—419

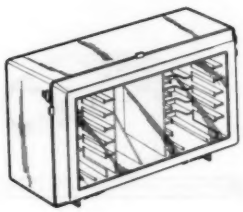
278,110
WINE RACK
Edward J. Boland, II, 2019 Research Dr. P.O. Box 1187, Livermore, Calif. 94550
Filed Jul. 23, 1982, Ser. No. 401,127
Term of patent 14 years
U.S. Cl. D6—465



278,111
FRAME CORNER RETAINER
Albert Mazeika, 9665 Baker, Tucson, Ariz. 85710
Filed Sep. 28, 1982, Ser. No. 426,120
Term of patent 14 years
U.S. Cl. D6—491



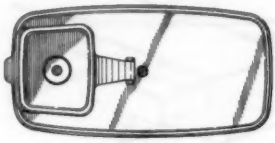
278,112
STORAGE CASE FOR TAPE CARTRIDGES
Joseph E. Stanton, 2457 Valley View, Troy, Mich. 48084
Filed Nov. 17, 1982, Ser. No. 442,339
Term of patent 14 years
U.S. Cl. D6—407



278,113
TRAY
Wilson B. Prophet, Jr., South Norwalk; William G. Wolfe, Riverside, and Thomas J. Simmons, Weston, all of Conn., assignors to The Carousel Group, Inc., East Norwalk, Conn.
Filed Aug. 20, 1982, Ser. No. 409,914
Term of patent 14 years
U.S. Cl. D7—27

278,114
TRAY
Wilson B. Prophet, Jr., South Norwalk; William G. Wolfe, Riverside, and Thomas J. Simmons, Weston, all of Conn., assignors to The Carousel Group, Inc., East Norwalk, Conn.
Filed Aug. 20, 1982, Ser. No. 409,911
Term of patent 14 years
U.S. Cl. D7—38

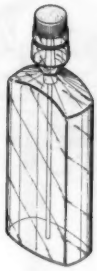
278,115
CONTAINER COVER WITH POUR SPOUT OR THE LIKE
Janice L. Leininger, Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 10, 1982, Ser. No. 406,794
Term of patent 14 years
U.S. Cl. D7—392



278,116
COFFEE FILTER HOLDER
Brian J. Gavin; Christopher C. Gavin, and Michael T. Gavin, all of 3380 Merrick Rd., Seaford, L.I., N.Y. 11783
Filed Jul. 20, 1982, Ser. No. 400,228
The portion of the term of this patent subsequent to Jun. 5, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—400

278,117
CONTOURED PAIR OF SCISSORS
Sharon K. Smith, 2416 Southway Dr., Fort Wayne, Ind. 46825
Filed Aug. 30, 1982, Ser. No. 412,386
Term of patent 14 years
U.S. Cl. D8—57

278,118
BOTTLE
Earl E. Hoyt, Franklin Lakes, N.J., assignor to Johnson & Johnson Products Inc., New Brunswick, N.J.
Filed Sep. 24, 1982, Ser. No. 423,382
Term of patent 14 years
U.S. Cl. D9—403



278,119
COMBINED BOTTLE AND CAP
Ned Harris, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1982, Ser. No. 423,879
Term of patent 14 years
U.S. Cl. D9—300

278,120
BOTTLE
Lynd L. Grant, Pickerington, and James Steinfurth, Columbus, both of Ohio, assignors to National Packaging Corporation, Columbus, Ohio
Filed Nov. 5, 1981, Ser. No. 318,379
Term of patent 14 years
U.S. Cl. D9—302

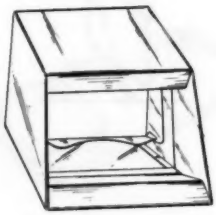
278,121
TALC POWDER DISPENSER
Morris Sussman, Freeport, N.Y., assignor to Shore Plastics Inc., Freeport, N.Y.
Filed Jan. 18, 1982, Ser. No. 340,240
Term of patent 14 years
U.S. Cl. D9—352

278,122
BOTTLE
Ned Harris, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1982, Ser. No. 423,880
Term of patent 14 years
U.S. Cl. D9—385

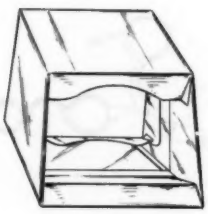
278,123
BOTTLE
Ned Harris, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1982, Ser. No. 423,883
Term of patent 14 years
U.S. Cl. D9—385

278,124
BOTTLE
Jean-Vincent Coussie, Chateaubernard, France, assignor to Union Cooperative de Viticulteurs Charentais, Cognac, France
Filed Nov. 2, 1982, Ser. No. 439,052
Term of patent 14 years
U.S. Cl. D9—389

278,125
DISPLAY CARTON
Albert A. Benham, Granville, Mass., assignor to Champion International Corporation, Stamford, Conn.
Filed Sep. 16, 1982, Ser. No. 418,632
Term of patent 14 years
U.S. Cl. D9—418

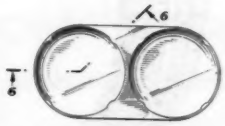


278,126
DISPLAY CARTON
Albert A. Benham, Granville, Mass., assignor to Champion International Corporation, Stamford, Conn.
Filed Sep. 16, 1982, Ser. No. 418,635
Term of patent 14 years
U.S. Cl. D9—418

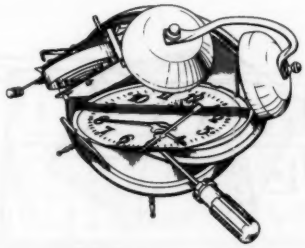


278,127
PISTON FOR A PRESSURIZED DISPENSING CONTAINER
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan
Filed Jun. 30, 1982, Ser. No. 393,793
Term of patent 14 years
U.S. Cl. D9—434

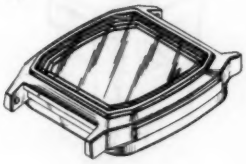
278,128
COMPARTMENTED HOLDER FOR BOTTLES OR THE LIKE
Robert VanDine, 944 Indian Peak Rd., Suite 200, Rolling Hills, Calif. 90274, and Gary Worth, 24959 John Fremont, Hidden Hills, Calif. 91302
Filed Aug. 20, 1981, Ser. No. 294,717
Term of patent 14 years
U.S. Cl. D9—455



278,129
NOVELTY CLOCK
Victor H. Chatten, 1567 W. 215th St., Torrance, Calif. 90501
Filed Jul. 19, 1983, Ser. No. 515,308
Term of patent 14 years
U.S. Cl. D10—6

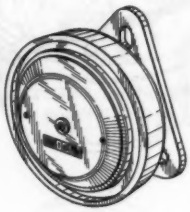


278,130
WATCH
John T. Houlihan, Watertown, Conn., and James J. Halicho, Sunnyvale, Calif., assignors to Timex Corporation, Waterbury, Conn.
Filed Mar. 17, 1983, Ser. No. 476,089
Term of patent 14 years
U.S. Cl. D10—38

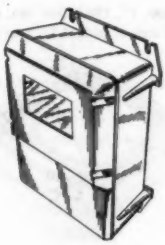


278,131
ANEMOMETRIC WIND VANE
Gary Felix, 1278 Glenneyve, #253, Laguna Beach, Calif. 92651
Filed Nov. 8, 1983, Ser. No. 549,779
Term of patent 14 years
U.S. Cl. D10—59

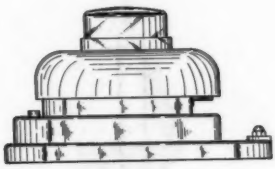
278,132
HUBODOMETER DESIGN
Patrick L. Powell, Franklin Park, Ill., assignor to Standard Car Truck Company, Park Ridge, Ill.
Continuation-in-part of Ser. No. 335,161, Dec. 28, 1981,. This application Dec. 15, 1982, Ser. No. 450,053
Term of patent 14 years
U.S. Cl. D10—98



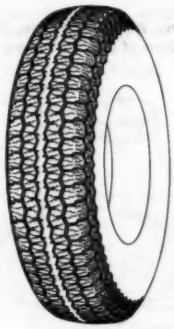
278,133
FLOWMETER TRANSMITTER CIRCUITRY HOUSING
Logan W. Johnson, Edina, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.
Filed Aug. 5, 1982, Ser. No. 405,518
Term of patent 14 years
U.S. Cl. D10—100



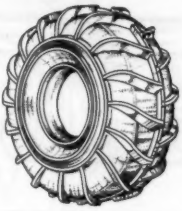
278,134
COMBINED WARNING LIGHT AND BELL FOR INDUSTRIAL AND INSTITUTIONAL APPLICATIONS
Wendell L. Jenkins, Canton, Ohio, assignor to The W. L. Jenkins Company, Canton, Ohio
Filed Jul. 22, 1982, Ser. No. 400,945
Term of patent 14 years
U.S. Cl. D10—114



278,135
TIRE
Armand M. Menster, Ettelbruck, and Leo J. Hitzky, Bonneweg, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 25, 1983, Ser. No. 469,879
Term of patent 14 years
U.S. Cl. D12—143

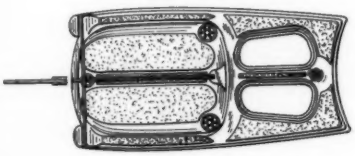


278,136
ROAD WHEEL TIRE
Yasuhiro Oba, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Ohtsu Tire & Rubber Co., Ltd., Osaka, both of, Japan
Filed Mar. 16, 1982, Ser. No. 358,572
Claims priority, application Japan, Sep. 18, 1981, 56-41352
Term of patent 14 years
U.S. Cl. D12—146

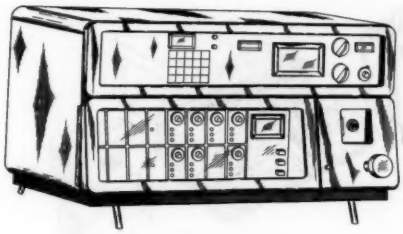


278,137
TIRE
Gary R. Larsen, and Harold C. Gray, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Oct. 24, 1983, Ser. No. 544,945
Term of patent 14 years
U.S. Cl. D12—147

278,138
CATAMARAN-HULLED SAILING SKIFF
Ramón Vila Enfedaque, Barcelona, Spain, assignor to Fibrester, S.A., Barcelona, Spain
Filed Jan. 7, 1981, Ser. No. 223,096
Term of patent 14 years
U.S. Cl. D12—304

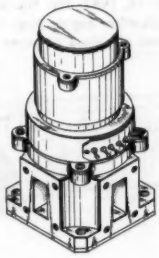


278,139
CONTROL CABINET
Jesse L. Morrison, Tucker, Ga., assignor to Nordson Corporation, Amherst, Ohio
Filed Mar. 11, 1983, Ser. No. 474,695
Term of patent 14 years
U.S. Cl. D13—12

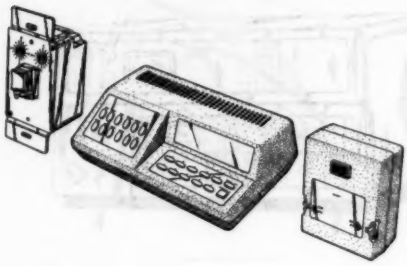


278,140
HEAT-CONDUCTING HEAT SINK COMPONENT FOR A THREE FLUID HEAT EXCHANGER
Gregory G. Tatum, Marietta, Ga., assignor to Sunfab, Ltd., Marietta, Ga.
Filed Sep. 20, 1982, Ser. No. 420,087
Term of patent 14 years
U.S. Cl. D13—23

278,141
WAVE GUIDE SWITCH
Clinton F. Steidel, La Mirada, Calif., assignor to Transco Products, Inc., Marina Del Rey, Calif.
Filed Nov. 1, 1982, Ser. No. 438,180
Term of patent 14 years
U.S. Cl. D13—32

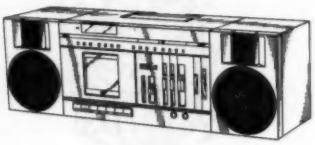


278,142
COMBINED RESIDENTIAL CONTROL CONSOLE, CONTROL SLAVE UNIT AND WALL SWITCH FOR THE REMOTE CONTROL OF LIGHTS AND APPLIANCES
Peter Chan, G.P.O. Box 6200, Hong Kong, Hong Kong
Filed Sep. 24, 1982, Ser. No. 423,377
Term of patent 14 years
U.S. Cl. D13—32

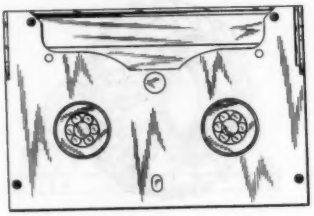


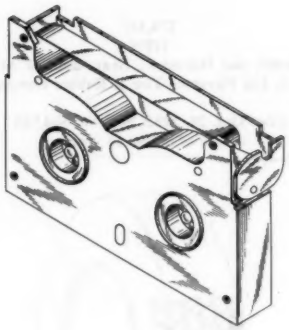
278,143
PRINTED CIRCUIT BOARD STANDOFF
Royce W. Hill, Flippin, Ark., assignor to Micro Plastics Inc., Flippin, Ark.
Filed Jan. 14, 1983, Ser. No. 458,172
Term of patent 14 years
U.S. Cl. D13—99

278,144
COMBINED TAPE RECORDER AND RADIO RECEIVER
Benito Mishiro, Osaka; Kikuo Ohta, Nara; Kunio Hoshino, Kyoto; Kazumasa Takenaka, Kanagawa, and Katsutoshi Kido, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 16, 1982, Ser. No. 450,179
Claims priority, application Japan, Jun. 16, 1982, 57-27165
Term of patent 14 years
U.S. Cl. D14—5



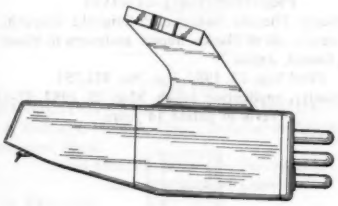
278,145
MAGNETIC TAPE CASSETTE
Yoshiharu Matsumoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 25, 1982, Ser. No. 411,297
Claims priority, application Japan, Mar. 30, 1982, 57-13317
Term of patent 14 years
U.S. Cl. D14—11

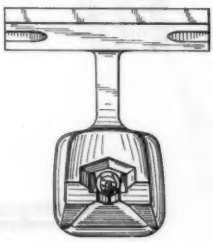




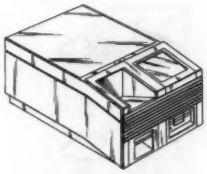
278,146
HAND MICROPHONE
Michael W. Young, Flushing, N.Y., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 27, 1982, Ser. No. 453,326
Term of patent 14 years
U.S. Cl. D14—12

278,147
PHONOGRAPH CARTRIDGE
John Kuykendall, Nesconset; Frank Frielingsdorf, Port Jefferson, and Alan Hofer, Wantagh, all of N.Y., assignors to Pickering & Company, Inc., Plainview, N.Y.
Filed Jan. 24, 1983, Ser. No. 460,283
Term of patent 14 years
U.S. Cl. D14—28



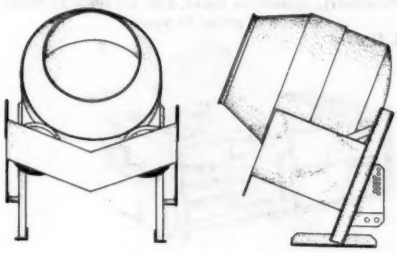


278,148
FLOPPY DISK COPIER MACHINE
Amancio Alcala, Santa Ana; James A. Norton, Orange, and Martin Smith, Manhattan Beach, all of Calif., assignors to Media Systems Technology Inc., Irvine, Calif.
Filed May 11, 1982, Ser. No. 377,195
Term of patent 14 years
U.S. Cl. D14—107



278,149
COMPUTER DISPLAY OR THE LIKE
Marina Naito, Matthews, N.C., assignor to International Business Machines, Armonk, N.Y.
Filed Oct. 15, 1982, Ser. No. 432,495
Term of patent 14 years
U.S. Cl. D14—113

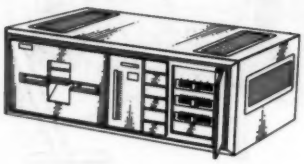
278,150
MIXER
Thomas I. Burenga, Litchfield, Ill., assignor to Worksaver, Inc., Litchfield, Ill.
Filed May 9, 1983, Ser. No. 492,803
Term of patent 14 years
U.S. Cl. D15—19



278,151
GUIDE UNIT FOR ASSOCIATING TUBULAR CASINGS WITH NUCLEAR FUEL ROD ASSEMBLIES
Seitaro Go, Tsuruga, Japan, assignor to Ugen Kaisha Go Chuzo Tekko Sho, Fukui, Japan
Filed Mar. 16, 1982, Ser. No. 358,764
Claims priority, application Japan, Sep. 17, 1981, 56-41385
Term of patent 14 years
U.S. Cl. D15—199

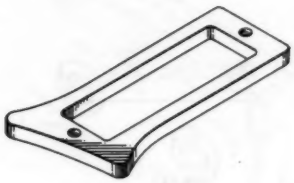
278,152
ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba; Shigeru Sutoh, Urawa; Tooru Okuyama, Isehara, and Kiyoshi Fujii, Kanagawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jan. 19, 1983, Ser. No. 459,186
Claims priority, application Japan, Jul. 19, 1982, 57-32293
Term of patent 14 years
U.S. Cl. D16—31

278,153
PIANO PLAYER
Kunio Ohta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed Aug. 4, 1982, Ser. No. 405,288
Claims priority, application Japan, Feb. 19, 1982, 57-7069
Term of patent 14 years
U.S. Cl. D17—9



278,154
ELECTRONIC MUSICAL INSTRUMENT KEYBOARD
Mark H. Baker, Redondo Beach, Calif., assignor to David H. Joseph, Los Angeles, Calif.
Filed Nov. 12, 1982, Ser. No. 440,875
Term of patent 14 years
U.S. Cl. D17—9

278,155
COMBINED MOUNTING RING AND THUMBREST FOR A MUSICAL INSTRUMENT
Hartley D. Peavey, and Michael V. Powers, both of Meridian, Miss., assignors to Peavey Electronics Corp., Meridian, Miss.
Filed Oct. 18, 1982, Ser. No. 434,870
Term of patent 14 years
U.S. Cl. D17—20

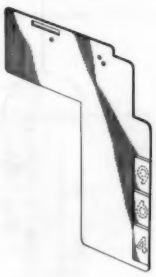


278,156
PRINTING CALCULATOR
Masaji Sawada; Hiroshi Sakaguchi; Shigeaki Hayashi, and Kazuo Yamada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 27, 1982, Ser. No. 431,75[illegible]
Claims priority, application Japan, Mar. 25, 1982, 57-12492
Term of patent 14 years
U.S. Cl. D18—7

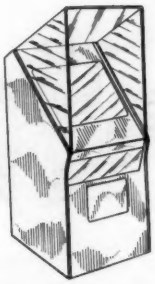
278,157
BALL POINT PEN
Mitsuo Maki, Tokyo; Tomohiro Hosoo, Chiba, and Katsuyoshi Kikukawa, Koshigaya, all of Japan, assignors to Platinum Pen of America, Dallas, Tex.
Filed May 8, 1981, Ser. No. 261,986
Claims priority, application Japan, Jun. 4, 1980, 55/21994
Term of patent 14 years
U.S. Cl. D19—51

278,158
NOTE MEMO HOLDER
James R. Dunn, Fairfield, Conn., assignor to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 20, 1983, Ser. No. 459,625
Term of patent 14 years
U.S. Cl. D19—91

278,159
SIDE INDEXING CARD FOR A BINDER OR THE LIKE
Gary J. Bellanca, Holden, Mass., assignor to Wright Line Inc., Worcester, Mass.
Filed Mar. 25, 1982, Ser. No. 361,642
Term of patent 14 years
U.S. Cl. D19—100

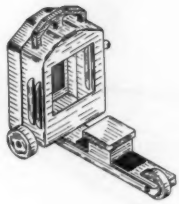


278,160
VIDEO GAME CABINET
David Nutting, Barrington Hills, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Filed Feb. 24, 1982, Ser. No. 351,614
Term of patent 14 years
U.S. Cl. D21—13

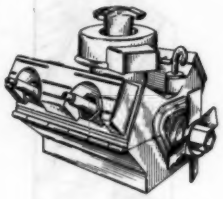


278,161
RIDING TOY
Girard A. Benicaso, Oak Park, Ill., assignor to Milton Bradley International, Inc., Springfield, Mass.
Filed Mar. 19, 1981, Ser. No. 245,617
Term of patent 14 years
U.S. Cl. D21—74

278,162
SCOOTER
Ernest D. Carmagnola, 2740 Len Dr., Bellmore, N.Y. 11710, and Peter Natale, 1600 N. Thompson Dr., Bay Shore, N.Y. 11706
Filed Nov. 23, 1982, Ser. No. 443,914
Term of patent 14 years
U.S. Cl. D21—80

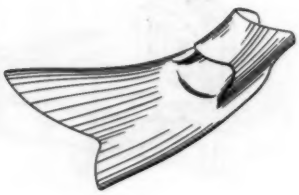


278,163
TOY TAKE-APART ENGINE
Robert L. Carignan, 1160 N. Market St., Elizabethtown, Pa. 17022; Timothy Effler, 6414 Aspen Way, Cincinnati, Ohio 45225, and John E. Holden, R.D. #1, Box 315, Mount Joy, Pa. 17552
Filed Aug. 18, 1982, Ser. No. 409,077
Term of patent 14 years
U.S. Cl. D21—125

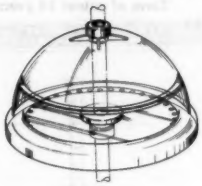


278,164
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982,. This application Jun. 29, 1984, Ser. No. 626,643
Term of patent 14 years
U.S. Cl. D21—190

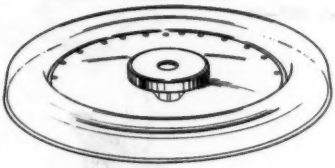
278,165
SWIMFIN WITH FLEXIBLE FIN MEMBER HAVING MOVABLE TIPS
Robert B. Evans, 28 Anacapa St., Santa Barbara, Calif. 93101
Filed Jun. 15, 1981, Ser. No. 273,724
Term of patent 14 years
U.S. Cl. D21—239



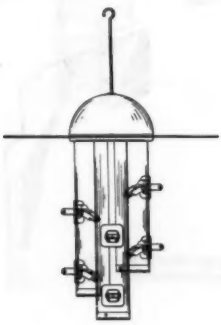
278,166
BIRD FEEDER
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Jan. 25, 1983, Ser. No. 460,839
Term of patent 14 years
U.S. Cl. D30—14



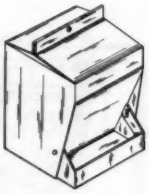
278,167
BIRD FEEDER TRAY
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Feb. 22, 1983, Ser. No. 468,178
Term of patent 14 years
U.S. Cl. D30—14



278,168
BIRD FEEDER
Peter A. Latham, Rye, N.H., and Ira Velie[illegible]y, Wayne, Pa., assignors to Opus, Inc., Framingham, Mass.
Filed Jan. 4, 1983, Ser. No. 455,603
Term of patent 14 years
U.S. Cl. D30—15

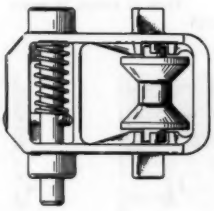


278,169
OUTDOOR BIRDFEEDER
John W. Cargile, Jr., Decatur, Ga., assignor to Container Corporation of America, Chicago, Ill.
Filed Aug. 22, 1983, Ser. No. 525,289
Term of patent 14 years
U.S. Cl. D30—15



278,170
SPRAY WASHER FOR PAINT ROLLERS
Joseph F. Megill, 10166 Crestview, and James V. Pagliaroni, 10388 Partridge Dr., both of Grass Valley, Calif. 95945
Filed Nov. 19, 1982, Ser. No. 442,939
Term of patent 14 years
U.S. Cl. D32—35

278,171
IDLER FOR A LOW PROFILE TIE DOWN
Richard A. Tatina, Countryside, Ill., assignor to Portec Inc., Oak Brook, Ill.
Filed Oct. 1, 1981, Ser. No. 307,644
Term of patent 14 years
U.S. Cl. D34—33

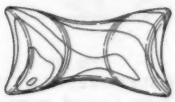


278,172
AUTO ROOF HOIST
Mark L. Ellis, 323½ Richmond St., El Segundo, Calif. 90245
Filed Sep. 30, 1982, Ser. No. 429,131
Term of patent 14 years
U.S. Cl. D34—33

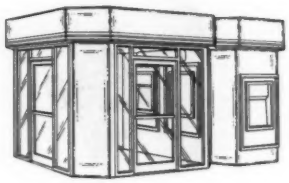
278,173
CART FOR SUPPORTING A LINE MARKER
Clive J. Morris, Cheam, England, assignor to Texalon International Limited, Surrey, England
Filed Aug. 5, 1982, Ser. No. 405,351
Claims priority, application United Kingdom, Apr. 21, 1982, 1006305
Term of patent 14 years
U.S. Cl. D34—17

278,174
CASKET CORNER PLATE
Francis R. Christian, River Forest, Ill., assignor to The Merit Company, Park Ridge, Ill.
Filed Aug. 2, 1982, Ser. No. 404,627
Term of patent 14 years
U.S. Cl. D99—13

278,175
OBJECT FOR USE IN MEDITATION AND TRANQUILIZATION
Russell V. Hardtke, 128 Stelle, Cayberry, Ill. 60919
Filed Sep. 23, 1982, Ser. No. 422,248
Term of patent 14 years
U.S. Cl. D99—25

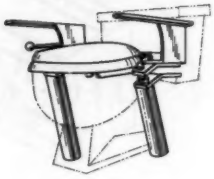


278,176
AUTOMATIC TELLER MACHINE ISLAND ENCLOSURE
David L. Root, Los Angeles, Calif., assignor to Hyde Park Metalfab Inc., Los Angeles, Calif.
Filed Sep. 13, 1982, Ser. No. 417,367
Term of patent 14 years
U.S. Cl. D99—28

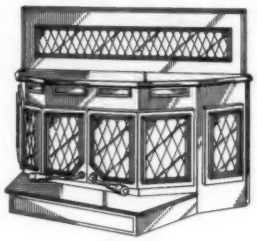


278,177
PASSENGER SEAT FOR AN AMUSEMENT RIDE
Michael J. Thornalley, Lincoln, England, assignor to Fibrecast (UK) Limited, Lincoln, England
Filed Aug. 19, 1982, Ser. No. 409,634
Claims priority, application United Kingdom, Feb. 22, 1982, 1005247
Term of patent 14 years
U.S. Cl. D21—247

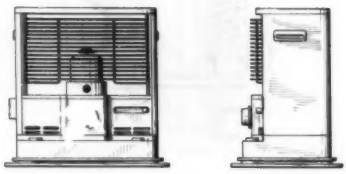
278,178
TILTABLE TOILET SEAT FOR DISABLED PERSONS
Joseph Loyd, 1032 N. Richman Ave., Fullerton, Calif. 92635
Filed May 3, 1982, Ser. No. 374,475
Term of patent 14 years
U.S. Cl. D23—71



278,179
FIREPLACE INSERT
Richard D. Craver, Orrville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio
Filed Apr. 25, 1984, Ser. No. 603,910
Term of patent 14 years
U.S. Cl. D23—94



278,180
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Nagoya, Japan
Filed Nov. 5, 1982, Ser. No. 439,487
Term of patent 14 years
U.S. Cl. D23—123

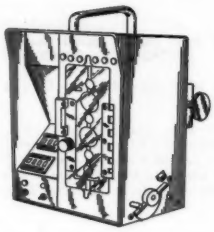


278,181

INTRAVENOUS VOLUMETRIC INFUSION PUMP

G. Kent Archibald, and Gerald W. Blume, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1982, Ser. No. 372,920
Term of patent 14 years
U.S. Cl. D24—8

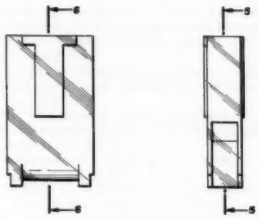


278,182

CUVETTE FOR A SAMPLE OF LIQUID SERUM OR THE LIKE

Takayuki Aihara, Hachioji; Kazuo Kawakami, and Yawara Nagai, both of Tokyo, all of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Oct. 7, 1982, Ser. No. 433,266
Claims priority, application Japan, Apr. 10, 1982, 57-15432
Term of patent 14 years
U.S. Cl. D24—29

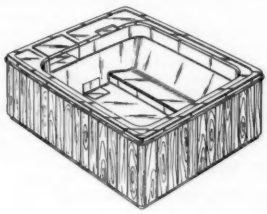


278,183

HYDROTHERAPY SPA

Dean Myers, Santa Ana, Calif., assignor to Gerico Fiberglass Products, Inc., Huntington Beach, Calif.

Filed Sep. 7, 1982, Ser. No. 415,394
Term of patent 14 years
U.S. Cl. D24—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF MARCH, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GmbH: *See*—
Lautenschlager, Hans-Heiner; Hilboll, Gerd; Friehe, Hugo; and Lohr, Josef P., 4,507,298, Cl. 514-247.000.

A. R. F. Products: *See*—
Stolarczyk, Larry G.; and Owerko, John R., 4,507,654, Cl. 340-545.000.

A/S Ferrosan: *See*—
Braestrup, Claus T.; Christensen, Joergen A.; Engelstoft, Mogens; and Waetjen, Frank, 4,507,313, Cl. 514-220.000.

Aamodt, Norman O. Oil filter wrench. 4,506,568, Cl. 81-64.000.

Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. System for regulating the idle speed of an internal combustion engine. 4,506,640, Cl. 123-339.000.

Abe, Kunio: *See*—
Ikedo, Yuji; Abe, Kunio; and Saito, Masatsugu, 4,507,768, Cl. 369-77.100.

Abe, Masaru; Miyoshi, Isao; Tezuka, Toshiro; and Yoshimoto, Toshio, to Bridgestone Tire Company Limited. Pneumatic tires for off-road vehicles. 4,506,718, Cl. 152-361.00R.

Abe, Tetsuro: *See*—
Shiraki, Hiroyuki; and Abe, Tetsuro, 4,507,458, Cl. 528-49.000.

Abel, Irving R.: *See*—
Howard, James W.; and Abel, Irving R., 4,507,551, Cl. 250-216.000.

ABG-Werke GmbH: *See*—
Heims, Dirk; Ottermann, Hans-Gert; and Prang, Robert, 4,507,014, Cl. 404-102.000.

Abrahams, Louis: *See*—
Hutchins, Burleigh M.; Dunlap, Raymond R.; and Abrahams, Louis, 4,507,044, Cl. 414-744.00R.

Abrahamson, John C., to Custom Touch Electronics. Touch responsive security and antitheft system. 4,507,644, Cl. 340-64.000.

Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG: *See*—
Ruch, Jean; Katryniok, Detlef; and Pack, Hugo, 4,507,367, Cl. 429-27.000.

Acker, Richard C., to Teledyne Industries, Inc. Pressure regulating valve. 4,506,693, Cl. 137-116.300.

Adachi, Takashi: *See*—
Tamai, Masaharu; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; Omura, Sadafumi; and Katunuma, Nobuhiko, 4,507,232, Cl. 260-112.50R.

Adair, Paul C.; Duda, Homer G.; Burkholder, Amy L.; Wright, Richard F.; and Stanley, Mary M., to Mead Corporation, The. Non-aqueous silver halide diffusion imaging system. 4,507,381, Cl. 430-246.000.

Adams, Charles C. Fish hook. 4,506,470, Cl. 43-44.800.

Adams, Gerald J.; Burkett, William L., Jr.; and Smolik, John V., to Hughes Aircraft Company. Payload deployment from launch vehicle using canted springs for imparting angular and linear velocities. 4,506,852, Cl. 244-158.00R.

Adams, Graham R.: *See*—
Dewan, Shashi B.; and Adams, Graham R., 4,507,722, Cl. 363-79.000.

Adams, Tello D., to GTE Automatic Electric Incorporated. Digital signal transmission system. 4,507,793, Cl. 375-36.000.

Adamski, Joseph R.: *See*—
Teich, Wesley W.; and Adamski, Joseph R., 4,507,531, Cl. 219-10.55B.

Adamson, Thomas; and Schmaltz, Armand J. Adjustable boring head tool holder. 4,507,027, Cl. 408-197.000.

Aderans Company, Ltd.: *See*—
Watabe, Nobuo, 4,507,356, Cl. 428-252.000.

Adidas Fabrique de Chassures de Sport: *See*—
Chassaing, Jacques, 4,506,463, Cl. 36-131.000.

Adjustable Bushing Corporation: *See*—
Lew, Wing G.; Deutsch, Richard A.; and Nasserian, Mojtaba, 4,507,034, Cl. 411-21.000.

Adl, Ali; and Backus, William D., to AT&T Bell Laboratories. Stranded cable termination arrangement. 4,507,008, Cl. 403-275.000.

Adorni, Franco, to Innse Innocenti Santeustacchio S.p.A. Revolving-ladle turret for continuous casting plants. 4,506,814, Cl. 222-591.000.

Advanced Electromagnetics, Inc.: *See*—
Hemming, Leland H., 4,507,660, Cl. 343-18.00A.

Advanced Micro Devices, Inc.: *See*—
Erb, Darrell M., 4,507,159, Cl. 148-190.000.

Aero Engineering Corporation of Clearwater: *See*—
Swaney, Gary; and Sells, Donald E., 4,506,522, Cl. 62-243.000.

Aerotex Hochleistungsfaser GmbH: *See*—
Pott, Richard, 4,507,164, Cl. 156-177.000.

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Hamasaki, Masanobu, 4,507,540, Cl. 219-121.0LD.
Nara, Koichi, 4,506,996, Cl. 374-176.000.
Toibana, Yasuo; and Ueno, Kazuo, 4,507,224, Cl. 252-516.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Luhrig, Hermann; and Kovacic, Guido, 4,506,843, Cl. 242-74.000.

Agrawal, Mahendra P., to Texas Instruments Incorporated. Data processing apparatus having alterable interest rate mode capability. 4,507,745, Cl. 364-709.000.

Aguirre, Donald G., to United States of America, Air Force. Measurement of permittivity and permeability of microwave materials. 4,507,602, Cl. 324-58.00R.

Ahad, Munir J., to American Safety Equipment Corporation. Three-point automatic restraint system. 4,506,912, Cl. 280-803.000.

Aioi Seiki Kabushiki Kaisha: *See*—
Yonezawa, Keitaro, 4,506,871, Cl. 269-24.000.

Air Products and Chemicals, Inc.: *See*—
Lenney, William E., 4,507,429, Cl. 524-800.000.
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,507,459, Cl. 528-64.000.

Aisan Industry Co., Ltd.: *See*—
Yoshida, Shigeru, 4,507,132, Cl. 55-320.000.

Ajinomoto Co., Inc.: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Shimizu, Eikou; and Shiio, Tsuyoshi, 4,507,282, Cl. 424-117.000.

Akab of Sweden AB: *See*—
Ragnebring, Chris, 4,506,613, Cl. 112-143.000.

Akebono Brake Industry Co., Ltd.: *See*—
Inoue, Takehisa; and Kinoshita, Kazuhisa, 4,506,767, Cl. 188-73.380.

Akiyama, Hidenori: *See*—
Satoh, Saburoh; Gotoh, Tatumi; Horii, Kenji; and Akiyama, Hidenori, 4,507,266, Cl. 422-186.150.

Akiyama, Kitio: *See*—
Shigenobu, Hiromichi; Nakabayashi, Takao; Akiyama, Kitio; Miida, Masao; and Karasawa, Hisashi, 4,506,596, Cl. 99-289.00T.

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Francke, Kurt O.; and Strand, Sten T., 4,506,559, Cl. 74-439.000.

Alandale Knitting Company, Inc.: *See*—
Gutschmit, Alan, 4,506,429, Cl. 29-450.000.

Alberta Oil Sands Technology and Research Authority: *See*—
Hyne, James B.; and Clark, Peter D., 4,506,733, Cl. 166-303.060.

Alcan International Limited: *See*—
Dube, Ghyslain, 4,507,150, Cl. 75-63.000.

Aldorf, Henry E., to Union Oil Company of California. Rare earth halide grease compositions. 4,507,214, Cl. 252-18.000.

Aldrich, Roger, to Chief Industries, Inc. Rocker clip assembly. 4,506,449, Cl. 33-288.000.

Alexander, Adam; and Piaget, Gary. Geometric device. 4,506,891, Cl. 273-153.00S.

Alexandrovich, Peter S., to Eastman Kodak Company. Self-fixing liquid electrographic developers. 4,507,377, Cl. 430-115.000.

Allden, Per O., to Alvema Rehab AB. Collapsible stroller. 4,506,906, Cl. 280-642.000.

Allen-Bradley Company: *See*—
Callan, John E., 4,507,571, Cl. 307-278.000.

Allen, Paul E., to Logic Devices, Inc. Liquid circulation apparatus and method. 4,507,056, Cl. 417-54.000.

Allied Colloids Limited: *See*—
Farrar, David; and Hawe, Malcolm, 4,507,422, Cl. 524-425.000.

Allied Corporation: *See*—
Flederbach, Mark; and Gallusser, David O., 4,506,942, Cl. 339-89.00M.
Hsieh, Samuel C., 4,507,713, Cl. 361-92.000.
Mathew, Chempolil T.; and Ulmer, Harry E., 4,507,248, Cl. 260-500.50H.
Soriano, David S.; Demmin, Timothy R.; and Robinson, Martin A., 4,507,251, Cl. 260-944.000.
Twilley, Ian C.; Turner, Garland L.; Saunders, Peter R.; and Haylock, John C., 4,507,361, Cl. 428-373.000.

Allis-Chalmers Corporation: *See*—
Schott, Robert E., 4,506,773, Cl. 192-52.000.
Sieren, Gerald E., 4,506,749, Cl. 180-69.200.

Allocco, Carmen, Jr.; Burger, William R.; and Counoupas, Steve S., to Xerox Corporation. Document registration system. 4,506,978, Cl. 355-14.0SH.

Alloy Metals, Inc.: *See*—
Stern, Marvin J., 4,507,264, Cl. 420-443.000.

Allred, Richard E.: *See*—
McCollin, Chris D.; Allred, Richard E.; Bearl, Leslie K.; and Card, David C., 4,506,730, Cl. 166-85.000.

Aloni, Roni, to Ramot University Authority For Applied Research And Industrial Development, Ltd. Plant growth method and composition. 4,507,144, Cl. 71-89.000.

Alvarez, Joseph A., III; Brennen, John F.; Krug, Robert W.; Gobioff, Bruce D.; and Shabe, John, to International Business Machines

Corporation. Time domain multiple access broadcasting, multipoint, and conferencing communication apparatus and method. 4,507,781, Cl. 370-104.000.

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Alzmann, Donald R.; Angelo, Michael; and Waldner, Paul R., to Lenkeit Industries, Inc. Method and apparatus for stacking a plurality of laminate layers to form a composite board. 4,506,442, Cl. 29-830.000.

AM International, Inc.: *See*—
Goodwin, Eber L.; and Zeigler, James E. L., 4,506,879, Cl. 271-238.000.

Amada Company, Limited: *See*—
Tobita, Chuo, 4,506,573, Cl. 83-153.000.

Amato, Phillip S.: *See*—
Linehan, Joseph J.; and Amato, Phillip S., 4,506,622, Cl. 114-230.000.

American Brands, Inc.: *See*—
Bennett, William T.; and Parks, Bennie L., 4,507,535, Cl. 219-121.0LL.

American Can Company: *See*—
Carbo, Adelaida L.; Good, Raymond H.; and Karas, Richard J., 4,507,339, Cl. 428-35.000.

American Filtrona Corporation: *See*—
Berger, Richard M., 4,507,107, Cl. 493-44.000.

American Home Products Corporation: *See*—
Bagli, Jehan F., 4,507,304, Cl. 514-269.000.

American Safety Equipment Corporation: *See*—
Ahad, Munir J., 4,506,912, Cl. 280-803.000.

Ameron, Inc.: *See*—
Friedrich, Ralph S.; and Naylor, Kenneth C., 4,506,918, Cl. 285-156.000.

AMF Inc.: *See*—
Rose, John A.; and Dyer, Keith, 4,507,029, Cl. 409-114.000.

Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., to Elfab Corporation. Apparatus for manufacturing integrated circuit connectors. 4,506,438, Cl. 29-739.000.

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Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,506,940, Cl. 339-17.0LC.
Cosmos, Pete; and Myers, Earl C., Jr., 4,506,937, Cl. 339-14.00R.

Ampex Corporation: *See*—
Barzee, Verl N., 4,506,967, Cl. 354-223.000.
Griesshaber, Karl H.; and Bialo, Charles A., 4,507,683, Cl. 358-185.000.

Amsted Industries Incorporated: *See*—
Peting, Robert G., 4,506,919, Cl. 285-231.000.

Analog & Digital Systems, Inc.: *See*—
Kelly, Michael L., 4,507,800, Cl. 381-88.000.

Anapliotis, Emmanuel, to Mecron medizinische Produkte GmbH. Nail for fixing a fracture of the femur. 4,506,662, Cl. 128-92.0BC.

Anbe, Yoshiharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for controlling continuous rolling mill and control apparatus therefor. 4,506,532, Cl. 72-8.000.

Andersen, Per F. Wave making machines. 4,507,018, Cl. 405-79.000.

Anderson, Carl E., to Anderson-Cook, Inc. Die for splining thin-wall power transmitting members. 4,506,537, Cl. 72-469.000.

Anderson-Cook, Inc.: *See*—
Anderson, Carl E., 4,506,537, Cl. 72-469.000.

Anderson, James Y. Powder dispensing container for dripless assembly to and disassembly from a flame spraying torch. 4,506,807, Cl. 222-181.000.

Anderson, Mardis V.: *See*—
Moorehead, Robert M.; Eppler, Susan G.; and Anderson, Mardis V., 4,507,735, Cl. 364-422.000.

Anderson, Richard N., to V. E. Anderson Mfg. Co. Window structure. 4,506,478, Cl. 49-181.000.

Anderson, Robert L., to Storage Technology Corporation. Microprocessor controlled tape capstan. 4,507,592, Cl. 318-268.000.

Ando, Kunio: *See*—
Inoue, Fumio; Jitsukata, Hiroshi; and Ando, Kunio, 4,507,585, Cl. 313-471.000.

Andow, Fumio; Okita, Yuji; and Suga, Noriyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Protective relaying system. 4,507,700, Cl. 361-80.000.

Andresen, Herman J. Lever stroke control. 4,507,601, Cl. 323-347.000.

Andrews, Barney A.: *See*—
Espey, Carl R.; and Andrews, Barney A., 4,506,399, Cl. 10-86.00R.

Andrews, Christopher M., to Ciba-Geigy Corporation. Heat-curable epoxide resin compositions. 4,507,445, Cl. 525-504.000.

Andrews, E. Trent; Lamb, Steve R.; and Moore, Robert R. Anesthetic supply valve and adapter for masks. 4,506,665, Cl. 128-202.270.

Angelo, Michael: *See*—
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Angersbach, Wolfgang; and Meier, Karl-Heinz, to Quick-Rotan Elektromotoren GmbH. Position adjusting drive unit. 4,507,596, Cl. 318-640.000.

Angstmann, Heinz-Dieter: *See*—
Streit, Werner; Witt, Linda; and Angstmann, Heinz-Dieter, 4,507,220, Cl. 252-186.100.

Ansite, William K. Self-contained ventilator/resuscitator. 4,506,667, Cl. 128-204.250.

Antensteiner, Norbert: *See*—
Hoyer, Otto; Antensteiner, Norbert; and Fortner, Walter, 4,506,425, Cl. 29-402.180.

Antoku, Fujio: *See*—
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,507,303, Cl. 514-255.000.

Aoki, Akihiro: *See*—
Shimada, Keizo; Sasaki, Hideharu; Mera, Hiroshi; Sawaki, Toru; and Aoki, Akihiro, 4,507,467, Cl. 528-348.000.

Aoki, Akio: *See*—
Ono, Eiichi; and Aoki, Akio, 4,507,711, Cl. 362-61.000.

Aoki, Katashi. Method for injection molding a composite parison. 4,507,258, Cl. 264-255.000.

Aoyama, Keizo: *See*—
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo; 4,507,574, Cl. 307-448.000.

Aoyama, Masaharu; Hiraki, Shunichi; and Yonezawa, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,507,673, Cl. 357-23.00R.

Apostolos, John A., to State of California, Department of Transportation. Process for inhibiting corrosion of metal embedded in concrete and a reinforced concrete construction. 4,506,485, Cl. 52-515.000.

Appenzeller, Valentin; and Kusters, Eduard, to Kusters, Eduard. Controlled-deflection roll. 4,506,421, Cl. 29-116.0AD.

Applezweig, Norman: *See*—
Coleman, Douglas L.; and Applezweig, Norman, 4,507,289, Cl. 514-170.000.

Applied Power Inc.: *See*—
Stephens, Robert, 4,506,751, Cl. 180-89.150.

APV International Limited: *See*—
Marchant, George W., 4,506,697, Cl. 137-312.000.

Arai, Takeo: *See*—
Ban, Keisuke; Arai, Takeo; Sakakibara, Tatsuo; and Miyake, Noriaki, 4,506,721, Cl. 164-97.000.

Arakawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Makita, Muneharu; Oseto, Osamu; and Munemitsu, Toshiaki, 4,507,376, Cl. 430-109.000.

Araki, Kunihiko: *See*—
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Araya, Kotaro: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Arcadian Corporation, Inc.: *See*—
Pace, Gary M.; and Friedrich, James W., 4,507,142, Cl. 71-83.000.

Archer, Sydney; Benagiano, Giuseppe; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, to World Health Organization. Esters of 17 α-ethynyl 19-nor-testosterone and 17 α-ethynyl-18-homo-19-nor-testosterone and pharmaceutical compositions containing the same. 4,507,290, Cl. 514-172.000.

Ares, Roland A.: *See*—
DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., 4,506,523, Cl. 62-470.000.

Argandona, Toby: *See*—
Armbruster, Josef, Jr.; and Argandona, Toby, 4,506,529, Cl. 70-168.000.

Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for purifying 1,2-dichloroethane. 4,507,514, Cl. 570-262.000.

Armbruster, Gerhard; Neubert, Werner; and Schaal, Gunter, to Robert Bosch GmbH. Cutting roller. 4,506,711, Cl. 144-230.000.

Armbruster, Josef, Jr.; and Argandona, Toby. Standpipe security apparatus. 4,506,529, Cl. 70-168.000.

Armstrong, Robert G.; and Stewart, Richard L., to Popsicle Industries, Inc. Apparatus for releasably retaining a confection stick. 4,507,070, Cl. 425-126.00S.

Arnoldsson, Erik: *See*—
Hedlund, Bo P. S.; and Arnoldsson, Erik, 4,506,792, Cl. 212-223.000.

Arpine, Donald A., to Watson Machine Company, The. Reel support system. 4,506,499, Cl. 57-127.500.

Arretz, Emmanuel, to Societe Nationale Elf Aquitaine (Production). Production of 2-mercapto ethanol-1. 4,507,505, Cl. 568-62.000.

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Shimizu, Kunio; Kame, Yuichi; and Tsuji, Yoshimasa, 4,506,953, Cl. 350-276.00R.

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Hama, Yoshihiro, 4,506,959, Cl. 350-430.000.

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Asakawa, Kazuo, to Mitsubishi Gas Chemical Company, Inc. Process for preparation of methanol. 4,507,403, Cl. 518-713.000.

Asami, Yukio: *See*—
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,507,303, Cl. 514-255.000.

Asano, Tadashi; Suzuki, Tadashi; and Fujii, Tadatsugu, to Mitsubishi Denki Kabushiki Kaisha. Cooling and heating device. 4,506,521, Cl. 62-238.700.

Asao, Hiroshi: *See*—
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Aschinger, William T.; Pfeifer, Jack F.; and Shumaker, Dale E., to Columbus Show Case Company, The. Display case adapted for high level incandescent illumination. 4,507,714, Cl. 362-126.000.

Asculai, Samuel S.; and Rapp, Fred, to Exovir, Inc. Interferon-containing compositions. 4,507,281, Cl. 424-85.000.

ASEA Aktiebolag: *See—*
Blomkvist, Kent; and Nordvall, Jan O., 4,506,554, Cl. 73-862.360.
Kaufmann, Herbert; and Larsson, Jan, 4,507,534, Cl. 219-86.700.
Siby, Sture, 4,506,556, Cl. 73-862.630.

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Tam, Johann; Ashjaee, Jalal; Kuwaki, Nobuo B.; Ngo, Tuan M.; and Kung, Susan W., 4,507,078, Cl. 432-11.000.

Ashland Oil, Inc.: *See—*
Goel, Anil B.; and Throckmorton, Peter E., 4,507,243, Cl. 260-410.500.

Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., to May & Baker Limited. Hypoglycaemic and hypolipidaemic benzamide substituted (1H-) imidazole derivatives and compositions. 4,507,315, Cl. 514-396.000.

Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., to AMP Incorporated. Input/output intercard connector. 4,506,940, Cl. 339-17.0LC.

Asics Corporation: *See—*
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Asmus, Richard W.: *See—*
Collins, Albert V.; and Asmus, Richard W., 4,507,152, Cl. 106-18.310.

Asmussen, Jes; and Root, Joseph J., to Board of Trustees operating Michigan State University. Ion generating apparatus and method for the use thereof. 4,507,588, Cl. 315-39.000.

Assut S.A.: *See—*
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Austin, Stewart S.; Baldini, Joseph J., III; Jakubson, Joel E.; and Ryan, Clarke S., 4,507,783, Cl. 371-49.000.
Chapin, John T.; and Sabia, Raffaele A., 4,507,362, Cl. 428-383.000.
Conway, John H.; and Sloane, Neil J. A., 4,507,648, Cl. 340-347.0DD.
Dubois, Lawrence H.; and Nuzzo, Ralph G., 4,507,401, Cl. 502-242.000.
Fraser, Alexander G., 4,507,760, Cl. 365-221.000.
Kmetz, Allan R., 4,506,955, Cl. 350-336.000.
Madden, James J., 4,506,938, Cl. 339-17.0CF.
Smith, Peter W., 4,507,776, Cl. 370-4.000.

AT&T Technologies, Inc.: *See—*
Schaaf, Theodore F., 4,507,330, Cl. 427-261.000.
Seefeldt, Roger L., 4,506,785, Cl. 206-334.000.

Atago, Takeshi: *See—*
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,506,646, Cl. 123-501.000.

Aubert, Michel; and Renaux, Charley, to Commissariat a l'Energie Atomigue. Handling process and installation for the assemblies of a neutron nuclear reactor. 4,507,261, Cl. 376-270.000.

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Dore, Jacques P.; and Guerlet, Bernard G. J., 4,507,100, Cl. 464-111.000.

Automotive Engine Associates: *See—*
Showalter, Merle R., 4,506,861, Cl. 251-139.000.
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Wimbush, Maurice J., 4,506,507, Cl. 60-584.000.

Avdel Limited: *See—*
Clarke, Ronald L. C.; and Savage, Donald S., 4,506,536, Cl. 72-391.000.

Axelrod, Robert J.; Campbell, John R.; and Ting, Sai-Pei, to General Electric Company. Compositions of polyphenylene ether resin and poly(tetra-alkylated bisphenol) having reduced melt viscosity. 4,507,436, Cl. 525-92.000.

Azuma, Nobuo; Satoh, Kenji; Mohri, Katsuo; and Furuhata, Takashi, to Hitachi, Ltd. Device for controlling consecutive recording of video information signals from video camera. 4,507,690, Cl. 360-33.100.

B. F. Goodrich Company, The: *See—*
Barron, Larry R.; and Wang, Pao-Chi, 4,507,443, Cl. 525-453.000.
Chasar, Dwight W., 4,507,416, Cl. 524-101.000.
Hoff, Charles M., Jr., 4,506,981, Cl. 356-347.000.
McRowe, Arthur W.; and Brown, Randall J., 4,507,414, Cl. 524-100.000.
Weaver, David E., 4,507,425, Cl. 524-460.000.

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Babler, Egon S., to Xerox Corporation. Print wheel mounting. 4,507,001, Cl. 400-144.200.

Bachtiger, Hans, to Gygli Technik AG. Method for attaching ready-made pieces of material to another piece of material. 4,506,615, Cl. 112-262.100.

Backus, William D.: *See—*
Adl, Ali; and Backus, William D., 4,507,008, Cl. 403-275.000.

Baden, Hans-Gunter: *See—*
Flach, Jurgen, deceased; Opitz, Rigobert; Daugart, Heinz; and Baden, Hans-Gunter, 4,507,608, Cl. 324-220.000.

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Lamar, Roger H.; and Davis, Robert A., 4,506,514, Cl. 62-91.000.

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Bakel, Izhak, to Geshuri Laboratories Ltd. Process for producing N-phosphonomethylglycine acid. 4,507,250, Cl. 260-502.50F.

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McCubbin, Charles E., 4,506,555, Cl. 73-862.460.

Baker, Edward D.; Lang-Ree, Nils; and Johnson, Ralph K., to Nieco Corporation. Pizza oven. 4,506,652, Cl. 126-21.00A.

Baker Industries, Inc.: *See—*
Vogt, William R.; and Wynne, John M., 4,507,652, Cl. 340-501.000.

Baker, Richard W., to Pako Corporation. Film-width and transmittance scanner system. 4,506,969, Cl. 354-298.000.

Baldini, Joseph J., III: *See—*
Austin, Stewart S.; Baldini, Joseph J., III; Jakubson, Joel E.; and Ryan, Clarke S., 4,507,783, Cl. 371-49.000.

Balle, Gerhard: *See—*
Slawyk, Wilhelm; Balle, Gerhard; Munzer, Manfred; and Wohnhas, Adolf, deceased, 4,507,444, Cl. 525-455.000.

Balliello, Paolo, to Ciba-Geigy Corporation. Cold water dispersible dyestuff granulates. 4,507,126, Cl. 8-526.000.

Balz, Werner: *See—*
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Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., 4,507,440, Cl. 525-218.000.

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Bank Constructors, Inc.: *See—*
Gerhard, Robert E., 4,506,428, Cl. 29-446.000.

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Baril, Michel; and Sillard, Gilles, to Thomson-CSF. Electromagnetic wave switch. 4,507,632, Cl. 333-258.000.

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Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,507,181, Cl. 204-15.000.

Barner, Robert P., Jr.; and Durham, William M., to International Business Machines Corporation. Medium speed multiples data. 4,507,779, Cl. 370-100.000.

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Childers, Roger K.; Buchanan, Kenneth L.; Barnette, Randall; and Buchanan, Delbert L., 4,506,685, Cl. 133-3.00A.

Barnie, James W.; and Rudko, Robert I., to Raytheon Company. Multiple pulse tea laser. 4,507,788, Cl. 372-83.000.

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Baron, Walter J., to Water Services of America, Inc. Four-way fluid flow diverter valve. 4,506,703, Cl. 137-625.430.

Barr, Dallas N.: *See—*
Nettleton, John E.; and Barr, Dallas N., 4,507,790, Cl. 372-100.000.

Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, to Lever Brothers Company. Skin treatment composition. 4,507,319, Cl. 514-546.000.

Barron, Larry R.; and Wang, Pao-Chi, to B. F. Goodrich Company, The. Sealant and coating composition. 4,507,443, Cl. 525-453.000.

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Roake, Joseph C., 4,506,439, Cl. 29-747.000.
Bartlett, Gary F.; and Olsen, Robert W., to Construction Specialties, Inc. Panel wall system. 4,506,484, Cl. 52-476.000.
Bartz, Stephen A., to Lucht Engineering, Inc. Paper cutter. 4,506,824, Cl. 234-28.000.
Barzee, Verl N., to Ampex Corporation. Apparatus facilitating the aiming for view finder. 4,506,967, Cl. 354-223.000.
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BASF Aktiengesellschaft: *See*—
Blum, Rainer; Spoor, Herbert; Holtmann, Gerhard; and Osterloh, Rolf, 4,507,456, Cl. 528-45.000.
Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, 4,507,274, Cl. 423-573.00R.
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Straehle, Wolfgang; Denni, Raymond; and Marx, Matthias, 4,507,475, Cl. 536-120.000.
Streit, Werner; Witt, Linda; and Angstmann, Heinz-Dieter, 4,507,220, Cl. 252-186.100.
Stutz, Herbert; and Eckert, Gunter, 4,507,431, Cl. 524-840.000.
Van Deyck, Frans; Weiss, Franz-Josef; Verberckt, Roger; Thomas, Erwin; Mangelschots, Benedikt; and Pijl, Paul, 4,507,271, Cl. 423-387.000.
Bashford, Anthony J., to NCR Corporation. Dual directional document drive apparatus. 4,506,878, Cl. 271-227.000.
Bateman, Charles D., to Sundstrand Data Control, Inc. Aircraft weight and balance system with automatic loading error correction. 4,507,742, Cl. 364-567.000.
Bateman, Glenn, to Tektronix, Inc. Non-linear amplifier systems. 4,507,615, Cl. 328-142.000.
Bates, Alexander P.; and Harcourt, Philip E., to Bergeson, Lloyd. Wing sail drive system. 4,506,619, Cl. 114-91.000.
Bates, Kenneth C. Apparatus for determining various operational conditions of an aircraft. 4,507,657, Cl. 340-959.000.
Battson, Donald F., to RCA Corporation. Reducing grain in multi-phase-clocked CCD imagers. 4,507,684, Cl. 358-213.000.
Bauer, Helmut: *See*—
Krob, Erwin; and Bauer, Helmut, 4,506,905, Cl. 280-633.000.
Bauer, Roger E.; Straalsund, Jerry L.; and Chin, Bryan A., to United States of America, Energy. Comminuting irradiated ferritic steel. 4,507,227, Cl. 252-626.000.
Baughman, Daniel G. Pin with detachable face. 4,507,344, Cl. 428-99.000.
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Baxter Travenol Laboratories, Inc.: *See*—
Bohman, Paul; Hart, John; and Fabisiewicz, Gene, 4,507,114, Cl. 604-111.000.
Gajewski, Henry M.; Vernick, Barry H.; Measells, Paul E.; and Garber, Jan W., 4,507,387, Cl. 435-2.000.
Bayer Aktiengesellschaft: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,507,292, Cl. 514-183.000.
Jautelat, Manfred, 4,507,496, Cl. 560-266.000.
Potter, Terry A.; Nachtkamp, Klaus; and Weider, Franz, 4,507,427, Cl. 524-591.000.
Rasshofer, Werner, 4,507,464, Cl. 528-288.000.
Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,507,141, Cl. 71-76.000.
Slawyk, Wilhelm; Balle, Gerhard; Munzer, Manfred; and Wohnhas, Adolf, deceased, 4,507,444, Cl. 525-455.000.
Thoma, Wilhelm; Langel, Rolf; Schmitz, Anton; and Schroer, Walter, 4,507,413, Cl. 524-42.000.
Bayer, Edward B. Electronic sound detecting unit for locating missing articles. 4,507,653, Cl. 340-539.000.
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Krappel, Alfred; Guggenmos, Johannes; and Holzmann, Josef, 4,506,643, Cl. 123-418.000.
Melzer, Hans-Harald, 4,506,505, Cl. 60-278.000.
Bays, David E.: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; and Carey, Linda, 4,507,296, Cl. 514-212.000.
Bazin, Alain: *See*—
Ley, Anthony J.; and Bazin, Alain, 4,507,624, Cl. 332-11.00D.
BBC Brown, Boveri & Company, Limited: *See*—
Gohrich, Klaus; and Vogt, Heinz, 4,507,593, Cl. 318-563.000.
Wiesmann, Rudolf, 4,507,253, Cl. 261-22.000.
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McCollin, Chris D.; Allred, Richard E.; Bearl, Leslie K.; and Card, David C., 4,506,730, Cl. 166-85.000.
Bechtel International Corporation: *See*—
Carney, John C., 4,507,022, Cl. 406-50.000.
Beck, Heinrich, to Bobst SA. Device for splicing a moving web to a web of a new roll. 4,506,842, Cl. 242-58.300.
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Olson, Gene E.; Stout, Christopher B.; Grover, Donald D.; and Becker, Thomas P., 4,506,546, Cl. 73-119.00A.
Beckman Instruments, Inc.: *See*—
Kampf, Richard S., 4,506,777, Cl. 198-341.000.
Beckstead, Dell R.: *See*—
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Beckwith, Bruce R.: *See*—
Kingsbury, Charles M.; Beckwith, Bruce R.; and Messina, Anthony, 4,507,138, Cl. 65-158.000.
Becton Dickinson and Company: *See*—
Ray, David J., 4,506,551, Cl. 73-660.000.
Bedard, Pierre, to Molrose Management, Ltd. Cardiac valve prosthesis holder. 4,506,394, Cl. 3-1.500.
Bedell, John R., to Electric Power Research Institute. Method and apparatus for magnetically holding a cast metal ribbon against a belt. 4,506,725, Cl. 164-463.000.
Bednar, Ernest G. Utility pole and tree climbing aid. 4,506,762, Cl. 182-221.000.
Bedolo, Orlando. Refrigerating-cycle heat pump purifying system for condensable gaseous mixtures of dry-cleaning plants. 4,506,515, Cl. 62-93.000.
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Beecham Group p.l.c.: *See*—
Smith, Richard A. G., 4,507,283, Cl. 424-94.000.
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Puntener, Alois; and Beffa, Fabio, 4,507,124, Cl. 534-695.000.
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Shapiro, Jacov, 4,506,502, Cl. 60-39.430.
Belenger, Jacques; and Jeanjacquot, Alain. Centrifugal clinical blood pump. 4,507,048, Cl. 415-90.000.
Bellocci, Rio; Gourmel, Yves; and Pierrel, Michel, to Pont a Mousson S.A. Tubular die for the continuous casting of a thin-walled tube. 4,506,723, Cl. 164-421.000.
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Bendell, Sidney L., to RCA Corporation. Color TV camera with four-port prism. 4,507,679, Cl. 358-55.000.
Benedict, Ralph H., Jr., to Touch-On, Inc. Touch switchable lamp. 4,507,716, Cl. 362-295.000.
Bennett, William T.; and Parks, Bennie L., to American Brands, Inc. Method and apparatus for perforating material. 4,507,535, Cl. 219-121.0LL.
Benton, Clarence E.: *See*—
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Lincoln, Clark N.; and Benzing, Norman L., 4,506,806, Cl. 222-175.000.
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Berger, Richard M., to American Filtrona Corporation. Filter manufacturing technique. 4,507,107, Cl. 493-44.000.
Bergeson, Lloyd: *See*—
Bates, Alexander P.; and Harcourt, Philip E., 4,506,619, Cl. 114-91.000.
Bergous, Rauno, to Valmet Oy. Tractor with improved frame construction. 4,506,756, Cl. 180-291.000.
Bergren, Kenneth B.: *See*—
Mullen, Charles K.; Shepherd, Gary D.; Fernandez, Ramon B.; and Bergren, Kenneth B., 4,507,272, Cl. 423-447.400.
Bernert, Claus-Rudiger; Kirchner, Hans-Gert; and Nader, Reinhard, to Wolff Walsrode Aktiengesellschaft. Process for the continuous granulation of carboxymethyl cellulose. 4,507,473, Cl. 536-86.000.
Bernou, Joseph; and Sguazzi, Georges, to La Soudure Autogene Francaise. Aligning and welding sheet plate edges. 4,506,821, Cl. 228-5.700.
Bethoon, Walter D.; and Shepard, Roderick C. Portable shelters. 4,506,688, Cl. 135-107.000.
Betts, Max W.: *See*—
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Beudat, Andre : *See*—
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Bever Control A/S: *See*—
Bjor, Hakon E., 4,506,745, Cl. 175-45.000.
Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., to International Business Machines Corporation. Method for contacting a narrow width PN junction region. 4,507,171, Cl. 156-643.000.
Bhatia, Satyapal S.: *See*—
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Bialo, Charles A.: *See—*
Griesshaber, Karl H.; and Bialo, Charles A., 4,507,683, Cl. 358-185.000.

Bichon, Daniel, to Assut S.A. Sheathed surgical suture filament and method for its preparation. 4,506,672, Cl. 128-335.500.

Bicron Corporation: *See—*
Noakes, John E.; and Culp, Randolph A., 4,507,226, Cl. 252-600.000.

Bien-Air: *See—*
Mosimann, David; Walther, Theodor; and Schnider, Jean-Pierre, 4,507,085, Cl. 433-126.000.

Bierens, John, to Granning Suspensions, Inc. Automotive vehicle suspension. 4,506,910, Cl. 280-711.000.

Bigelow, Lavell M.; Bigelow, Robert D.; and Bigelow, William S. Combustion method and apparatus. 4,506,653, Cl. 126-69.000.

Bigelow, Robert D.: *See—*
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Bjelvert, Sven; Olofsson, Goran; and Nystrom, Per, to Forenade Fabriksverken. Arrangement for a land mine. 4,506,603, Cl. 102-401.000.

Bjor, Hakon E., to Bever Control A/S. Method and means for drilling in rocks. 4,506,745, Cl. 175-45.000.

Bjorck, Paul M.: *See—*
Brown, Ivan R.; Bjorck, Paul M.; and Eaton, Brian M., 4,506,569, Cl. 82-2.00R.

Black & Decker Inc.: *See—*
Grossmann, Horst, 4,506,743, Cl. 173-48.000.

Black, Jonathan: *See—*
Brighton, Carl T.; and Black, Jonathan, 4,506,674, Cl. 128-419.00F.

Black, Robert D., to Deere & Company. Forage harvester shear bar with concave cutting surface. 4,506,839, Cl. 241-101.700.

Blackburn, Arthur M., to Otter Controls Limited. Snap-acting thermally-responsive bimetallic actuators. 4,507,642, Cl. 337-89.000.

Blackwell, George T. Adzing bit assembly. 4,506,715, Cl. 144-241.000.

Blake, Donald M., Jr., to Dow Chemical Company, The. Synergistic mixture of polyurethane and emulsion polymers useful as thickeners for aqueous systems. 4,507,426, Cl. 524-505.000.

Blake, Joseph W., III. Skin approximator. 4,506,669, Cl. 128-334.00R.

Blanchet, James, to Deepsea Ventures, Inc. Ocean floor dredge system having a pneumohydraulic means suitable for providing tripping and heave compensation modes. 4,506,591, Cl. 92-85.00B.

Blau, Heinrich; Gortz, Bernd; Grohmann, Werner; Meusel, Wolfgang; Niebergall, Heribert; and Waldmann, Hermann, to Siemens Aktiengesellschaft. System for error-protected operation of multipanel, power distribution network switches. 4,507,703, Cl. 361-193.000.

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Bloch, Ricardo: *See—*
Johnston, John E.; Bloch, Ricardo; Ver Strate, Gary W.; and Song, W. R., 4,507,515, Cl. 585-12.000.

Block, Dennis A., to Federal-Mogul Corporation. Springless self-aligning clutch release bearing assembly. 4,506,774, Cl. 192-98.000.

Block, Thomas S., to McGraw-Edison Company. Floor treating machine. 4,506,405, Cl. 15-320.000.

Blohm, Knud: *See—*
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Blum, Alvin S. Photon emission imaging apparatus and method. 4,507,733, Cl. 364-414.000.

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Board of Trustees operating Michigan State University: *See—*
Asmussen, Jes; and Root, Joseph J., 4,507,588, Cl. 315-39.000.
Blosser, Henry G.; Johnson, David A.; Riedel, Jack; and Burleigh, Richard J., 4,507,616, Cl. 328-234.000.

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Jeanneret, Yves; and Wenger, Jean-Louis, 4,506,782, Cl. 198-806.000.
Preisig, Roland, 4,506,874, Cl. 271-35.000.

Bodenmann, Eugen: *See—*
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Kunze, Wolfgang; and Schweckendieck, Bernd, 4,506,547, Cl. 73-150.00R.

Boeckel, John W., to Du Pont de Nemours, E. I., and Company. Adjustable photosensor mounting arrangement for a centrifuge. 4,507,110, Cl. 494-10.000.

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Wiedemann, Fritz; and Rieger, Ewald, 4,507,488, Cl. 548-362.000.

Boeing Aerospace Company: *See—*
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Boeing Company, The: *See—*
Brown, Stephen T., 4,507,011, Cl. 403-404.000.
Gupta, Alankar; Jenny, Robert W.; and Malone, Frank L., 4,506,851, Cl. 244-129.100.
McConnell, Charles H., 4,506,850, Cl. 244-54.000.

Bohman, Paul; Hart, John; and Fabisiewicz, Gene, to Baxter Travenol Laboratories, Inc. Multiple chamber container having leak detection compartment. 4,507,114, Cl. 604-111.000.

Bohn, Hans, to Behringwerke Aktiengesellschaft. Tissue protein PP_4, a process for isolating it and its use. 4,507,229, Cl. 260-112.00B.

Boll, Richard; and Friedrichs, Michael, to Vacuumschmelze GmbH. Contact-free push-button key for generating an electrical signal upon depression thereof. 4,507,651, Cl. 340-365.00L.

Bomches, Helmut; and Hardegger, Bruno, to Hoffmann-La Roche Inc. Purification of mefloquin hydrochloride. 4,507,482, Cl. 546-176.000.

Bonnaud, Bernard: *See—*
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,507,318, Cl. 514-531.000.

Bonne, Ulrich, to Honeywell Inc. Selective leak-detector for natural gas. 4,507,558, Cl. 250-345.000.

Bonnell, Leonard J., to Rorer Group Inc. Therapeutic treatment within joint capsules of the body. 4,506,673, Cl. 128-419.00F.

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Booker, Brian A. J., to Parker Pen Company, The. Pocket clip for a writing instrument. 4,506,426, Cl. 29-413.000.

Boom, Johannes; and Terlouw, Teunis, to Shell Oil Company. Distributing valve. 4,506,704, Cl. 137-883.000.

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Borg-Warner Chemicals, Inc.: *See—*
Hechenbleikner, Ingenuin; and Enlow, William P., 4,507,489, Cl. 549-375.000.

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Roberts, Richard W., 4,506,648, Cl. 123-564.000.

Borovsky, Simcha: *See—*
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Boston, Ernest B., to Phillips Petroleum Company. Metal passivation additive. 4,507,398, Cl. 502-62.000.

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Kadkade, Prakash G.; and Botticelli, Charles R., 4,506,474, Cl. 47-58.000.

Bourgeois, Harold C.: *See—*
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Bowditch, W. Raymond, to Wilmington Chemical Corporation. Low viscosity epoxy resins. 4,507,461, Cl. 528-104.000.

Bowermaster, Sidney P., to NDK, Incorporated. Wheelchair attachment. 4,506,903, Cl. 280-289.0WC.

Bowser, Paul A.: *See—*
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Boyd, Jerry L. Apparatus and method for volume filling of storage boxes. 4,506,492, Cl. 53-473.000.

Boyd, Walter K. Load securing apparatus for a cargo carrying vehicle. 4,507,033, Cl. 410-104.000.

Bracke, Harry: *See—*
Jahme, Hans-Joachim; and Bracke, Harry, 4,507,167, Cl. 156-345.000.

Brackman, William D., Jr.; D'Atre, John D.; and Walker, Loren H., to General Electric Company. Method for adaptive control in a power converter operating in a discontinuous current mode. 4,507,723, Cl. 363-87.000.

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Brandauer, Emil: *See—*
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,507,353, Cl. 428-222.000.

Brault, Richard A. Spineboard. 4,506,664, Cl. 128-134.000.

Braun Aktiengesellschaft: *See—*
Golob, Jurgen; and Gehrmann, Alfred, 4,507,006, Cl. 403-24.000.

Braunlich, Peter F.: *See—*
Gasiot, Jean; Braunlich, Peter F.; and Fillard, Jean P., 4,507,562, Cl. 250-484.100.

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Dria, Dennis E.; Bremer, Noel J.; Dria, Myra A.; and McKain, Rodger W., 4,507,212, Cl. 252-8.55D.

Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., to United States Steel Corporation. Horizontal-pass electrotreating cell. 4,507,190, Cl. 204-206.000.

Brenholdt, Irving R., to St. Regis Paper Company. Apparatus and method for determining pulp stock consistency. 4,507,556, Cl. 250-341.000.

Brennan, Robert J.; and Meighen, Terrence, to Stewart Stamping Corporation. Modular connector for terminating EMI/RFI shielded cordage and cord terminated thereby. 4,506,944, Cl. 339-143.00R.

Brennen, John F.: *See—*
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Brewer, Lewis E. Quick release drum head restraint. 4,506,586, Cl. 84-413.000.

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Franklin, Stanley, 4,506,389, Cl. 2-144.000.

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Utsunomiya, Tadashi; Matsumuro, Yasuhiko; and Saigo, Hideaki, 4,507,418, Cl. 524-318.000.

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Briggs, Aubrey C., to Dravo Corporation. Self training belt conveyor with digging elements. 4,506,781, Cl. 198-711.000.

Briggs, Richard J.: *See—*
Prono, Daniel S.; Caporaso, George J.; and Briggs, Richard J., 4,507,614, Cl. 328-233.000.

Bright, John T.: *See—*
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Bristol, James A.; and Lovey, Raymond G., to Schering Corp. Imidazo[1,2-a]pyrazines. 4,507,294, Cl. 514-249.000.

Bristol-Myers Company: *See—*
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; Oka, Masahisa; and Yamashita, Haruhiro, 4,507,487, Cl. 548-194.000.
Monkovic, Ivo; and Crenshaw, Ronnie R., 4,507,485, Cl. 546-210.000.
Tencza, Thomas M.; and Patell, Mahesh K., 4,507,276, Cl. 424-37.000.

Britax-Kolb GmbH & Co.: *See—*
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British Aerospace Public Limited Company: *See—*
Fletcher, James; and Wooding, Michael S., 4,506,848, Cl. 244-12.400.
Topping, Joseph R.; and Jones, John D., 4,506,448, Cl. 33-185.00R.

British Petroleum Company Limited, The: *See—*
Gordon, Kevin R.; Kelsey, Jeffrey R.; and Stannard, Ivan C., 4,507,411, Cl. 523-436.000.

British Petroleum Company p.l.c., The: *See—*
Duckworth, Roger; Johnson, Roy A.; and Lester, Timothy E., 4,507,177, Cl. 204-1.00R.

Britsch, Heinz, to Robert Bosch GmbH. Internal combustion engine. 4,506,633, Cl. 123-59.0EC.

Brittain, John E.: *See—*
Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., 4,506,600, Cl. 99-474.000.

Broeckels, Theo: *See—*
Kunz, Werner; and Broeckels, Theo, 4,507,542, Cl. 219-130.510.

Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, to BASF Aktiengesellschaft. Desulfurization of H_2S-containing gases. 4,507,274, Cl. 423-573.00R.

Brosh, Amnon. Rotary position sensors employing planar coils. 4,507,638, Cl. 336-79.000.

Brosigke, Michael, to Blohm & Voss AG. Ship's derrick. 4,506,791, Cl. 212-190.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Yanagi, Toshiaki, 4,506,612, Cl. 112-121.120.

Brown, Alvin E.; and Henneuse, Donald P., to Manning Technologies, Inc. Coaxial flowpath apparatus. 4,506,552, Cl. 73-861.280.

Brown, Clyde O.; and Tourtellotte, Raymond E., to Mostek Corporation. Laser hardening with selective shielding. 4,507,538, Cl. 219-121.00L.

Brown, Dwight C. Ratchet hinge structure. 4,506,408, Cl. 16-225.000.

Brown, Ivan R.; Bjorck, Paul M.; and Eaton, Brian M., to Hardinge Brothers, Inc. Multiple axis slant bed machine. 4,506,569, Cl. 82-2.00R.

Brown, James M. Sawhorse frame with strong clamping action and compact folding feature. 4,506,761, Cl. 182-186.000.

Brown, John M. Rectangular framed advertising display clock. 4,506,993, Cl. 368-314.000.

Brown, Randall J.: *See—*
McRowe, Arthur W.; and Brown, Randall J., 4,507,414, Cl. 524-100.000.

Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, to USV Pharmaceutical Corporation. Pyridotriazolopyrazine-diones for treating allergy. 4,507,300, Cl. 514-280.000.

Brown, Stephen T., to Boeing Company, The. Reinforced elastomer attachment joint. 4,507,011, Cl. 403-404.000.

Brown & Williamson Tobacco Corporation: *See—*
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Bruce, Charles W.; Kunkel, Kenneth E.; and Webb, Fred C., to United States of America, Army. Apparatus for measuring small values of air flow. 4,506,553, Cl. 73-861.650.

Brucher, Klaus: *See—*
Buss, Dietrich; Brucher, Klaus; and Wenz, Wilhelm, 4,507,075, Cl. 431-115.000.

Brucker, John P. Desoldering device. 4,506,820, Cl. 228-39.000.

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Brunelle, Daniel J., to General Electric Company. Titanium chelate catalyst. 4,507,246, Cl. 260-429.500.

Brunsgaard, Hans O.: *See—*
Jensen, Niels D.; and Brunsgaard, Hans O., 4,507,583, Cl. 310-338.000.

Bruso, Loran H., to Warner-Lambert Company. Instrument protector. 4,506,787, Cl. 206-363.000.

Buchanan, Alvin E.; and Buchanan, James E. Bicycle storage structure. 4,506,786, Cl. 206-335.000.

Buchanan, Delbert L.: *See—*
Childers, Roger K.; Buchanan, Kenneth L.; Barnette, Randall; and Buchanan, Delbert L., 4,506,685, Cl. 133-3.00A.

Buchanan, James E.: *See—*
Buchanan, Alvin E.; and Buchanan, James E., 4,506,786, Cl. 206-335.000.

Buchanan, Kenneth L.: *See—*
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Buchel, Karl H.: *See—*
Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,507,141, Cl. 71-76.000.

Buchfink, Adolf, to Claudius Peters AG. Mixing chamber silo for loose material. 4,506,985, Cl. 366-107.000.

Buchler, Ingrid, to Villeroy & Boch Keramische Werke KG. Letter card and confining means therefor. 4,506,823, Cl. 229-92.800.

Buell, Kenneth C.; and Cooper, Thomas F., to Xerox Corporation. Transfer system. 4,506,971, Cl. 355-3.0TR.

Bui-Hai, Nhu, to Thomson-CSF. Primary source with frequency re-utilization. 4,507,665, Cl. 343-786.000.

Buisson, Jacques; and Loitiere, Alain, to Commissariat a l'Energie Atomigue. Ultra-rapid hybrid linear amplifier. 4,507,620, Cl. 330-307.000.

Bull, Bernard T.: *See—*
Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., 4,507,315, Cl. 514-396.000.

Bullock, Joseph J., III, to Three Sisters Ranch Enterprises. Wine bottle cover. 4,506,797, Cl. 215-256.000.

Bulso, Joseph D., Jr.: *See—*
Doyle, Stephen D.; and Bulso, Joseph D., Jr., 4,506,534, Cl. 72-345.000.

Burge, Theodor; and Bodenmann, Eugen, to Sika AG, vorm. Kaspar Winkler & Co. Chloride-free setting accelerator for hydraulic binding agents. 4,507,154, Cl. 106-315.000.

Burger, William R.: *See—*
Allocco, Carmen, Jr.; Burger, William R.; and Counoupas, Steve S., 4,506,978, Cl. 355-14.0SH.

Burke Marketing Services, Inc.: *See—*
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Burkett, William L., Jr.: *See—*
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Burkholder, Amy L.: *See—*
Adair, Paul C.; Duda, Homer G.; Burkholder, Amy L.; Wright, Richard F.; and Stanley, Mary M., 4,507,381, Cl. 430-246.000.

Burleigh, Richard J.: *See—*
Blosser, Henry G.; Johnson, David A.; Riedel, Jack; and Burleigh, Richard J., 4,507,616, Cl. 328-234.000.

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Burroughs Corporation: *See—*
Catiller, Robert D.; and Forbes, Brian K., 4,507,732, Cl. 364-200.000.
Tustaniwskyj, Jerry I., 4,506,941, Cl. 339-75.00M.

Burroughs Wellcome Co.: *See—*
Stern, Warren C., 4,507,323, Cl. 514-649.000.

Burt, Richard A.: *See—*
Horgan, Anthony M.; Kazmaier, Peter M.; and Burt, Richard A., 4,507,480, Cl. 546-94.000.

Burton, Thomas M.: *See—*
Kucharska, Helena Z.; and Burton, Thomas M., 4,507,406, Cl. 521-85.000.

Bury, George J., to Illinois Tool Works Inc. LED Holder. 4,507,718, Cl. 362-396.000.

Busenhart, Peter: *See—*
Schlegel, Andy; and Busenhart, Peter, 4,506,692, Cl. 137-102.000.

Buss, Dietrich; Brucher, Klaus; and Wenz, Wilhelm, to Gewerkschaft Sophia-Jacoba. Combustion device. 4,507,075, Cl. 431-115.000.

Buss, Waldeen C., to Chevron Research Company. Semi-continuous regeneration of sulfur-contaminated catalytic conversion systems. 4,507,397, Cl. 502-38.000.

C.T.R. Inc.: *See*—
Webster, Daniel R., 4,507,424, Cl. 524-442.000.
Calagui, Juanito B. Twin fish hook. 4,506,469, Cl. 43-34.000.
Calavar Corporation: *See*—
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Caldwell-Nichols, Christopher J.: *See*—
Roach, Peter F.; Caldwell-Nichols, Christopher J.; and Thomson, Alexander, 4,507,603, Cl. 324-61.00P.
Caldwell, Robert D.: *See*—
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California Institute of Technology: *See*—
Rowlette, John R., 4,507,372, Cl. 429-228.000.
Callan, John E., to Allen-Bradley Company. Optically coupled input circuit for digital control. 4,507,571, Cl. 307-278.000.
Calmar, Inc.: *See*—
Corsette, Douglas F., 4,506,809, Cl. 222-213.000.
Cameto, L. Robert; and Jepson, Robert M., to Misto$_2$Gen Equipment Corporation. Thermoelectric air cooler for therapeutic tents. 4,506,511, Cl. 62-3.000.
Campbell, John R.: *See*—
Axelrod, Robert J.; Campbell, John R.; and Ting, Sai-Pei, 4,507,436, Cl. 525-92.000.
Campman, Arthur R.: *See*—
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Canada, Her Majesty the Queen in right of: *See*—
Waggoner, Clinton A.; Dominique, Harry P.; Moonie, Gary A.; and Kaye, Bruce J., 4,506,960, Cl. 350-529.000.
Cangiano, Frank: *See*—
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Canon Kabushiki Kaisha: *See*—
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Fujiki, Makoto; and Takayama, Makoto, 4,507,688, Cl. 360-13.000.
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,507,375, Cl. 430-128.000.
Kawamura, Naoto, 4,507,685, Cl. 358-283.000.
Kozuki, Susumu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,507,689, Cl. 360-33.100.
Sato, Hiroshi; Yabu, Shuichi; and Kosugi, Masao, 4,506,977, Cl. 355-53.000.
Cantrell, Daniel V.; and Sanford, Robert A., to Brown & Williamson Tobacco Corporation. Ventilated mouthpiece for a smoking article. 4,506,683, Cl. 131-336.000.
Cao, Carlos M. M.; and Gonzalez, Manuel T., to Empresa Cubana Importadora Y Exportadora de Productos Medicos. Composition and method for stimulating the synthesis of the melanotic pigment of the skin. 4,507,277, Cl. 424-59.000.
Capdebosco, Bernard; and Mion, Jean-Luc, to S. A. Martin. Suction-box feed device. 4,506,875, Cl. 271-99.000.
Caporaso, George J.: *See*—
Prono, Daniel S.; Caporaso, George J.; and Briggs, Richard J., 4,507,614, Cl. 328-233.000.
Caputo, William R., to Westinghouse Electric Corp. Angular accelerometer. 4,507,607, Cl. 324-164.000.
Carbo, Adelaida L.; Good, Raymond H.; and Karas, Richard J., to American Can Company. Coated metal container and method of making the same. 4,507,339, Cl. 428-35.000.
Card, David C.: *See*—
McCollin, Chris D.; Allred, Richard E.; Bearl, Leslie K.; and Card, David C., 4,506,730, Cl. 166-85.000.
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, to Tecnomagnetic i di Cardone, Grandini, Zaramella & C.S.a.s. Magnetic anchoring apparatus with quadrangular pole arrangement. 4,507,635, Cl. 335-291.000.
Carels, Walter E.: *See*—
Verhoeven, Leonardus A. J.; Scheltema, Otto E.; and Carels, Walter E., 4,507,681, Cl. 358-111.000.
Carey, Linda: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; and Carey, Linda, 4,507,296, Cl. 514-212.000.
Carlisle, Robert W. Oil filter unit and sealing device. 4,507,199, Cl. 210-238.000.
Carney, Frederick T., Jr.: *See*—
Shirley, Arthur R., Jr.; and Carney, Frederick T., Jr., 4,506,453, Cl. 34-12.000.
Carney, John C., to Bechtel International Corporation. Method and apparatus for transporting slurry along a pipeline. 4,507,022, Cl. 406-50.000.
Carr-Griff, Inc.: *See*—
Schoenmeyr, Ivar L., 4,507,054, Cl. 417-12.000.
Schoenmeyr, Ivar L., 4,507,058, Cl. 417-270.000.
Carrier Corporation: *See*—
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Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., to Hoffmann-La Roche Inc. Phenoxycarboxylic acids. 4,507,498, Cl. 562-463.000.
Carstensen, Walter H.: *See*—
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Carter, Charles G., to Stauffer Chemical Company. N-Acyl-N-alkyl hydroxylamine esters of substituted pyridyloxyphenoxy propionic acids and herbicidal methods of use. 4,507,148, Cl. 71-94.000.
Carter, Orvil L. Vibrating earth ripping apparatus. 4,506,740, Cl. 172-40.000.
Cartner, Jack O. Hydraulic breakaway system for mobile cutting apparatus. 4,506,464, Cl. 37-91.000.
Caruso, Anthony M. Firing mechanism. 4,506,606, Cl. 102-487.000.
Casadio, Silvano: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, 4,507,308, Cl. 514-313.000.
Casile, Jean P. Pericardiac circulatory assistance device. 4,506,658, Cl. 128-1.00D.
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Sunada, Takuya, 4,506,581, Cl. 84-1.100.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., 4,507,440, Cl. 525-218.000.
Castillo, Richard A., to Modulite Corporation. Method for threading chain onto a lamp cord. 4,506,427, Cl. 29-433.000.
Castle, Ross M. Curtain rod for sliding glass door. 4,506,477, Cl. 49-70.000.
Castolin S.A.: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,507,151, Cl. 75-251.000.
Cathey, Kenneth M. Hose holder. 4,506,853, Cl. 248-79.000.
Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. I/O subsystem using slow devices. 4,507,732, Cl. 364-200.000.
Cavanagh, Peter R., to Puma-Sportschuhfabriken Rudolf Dassler KG. Running shoe sole with pronation limiting heel. 4,506,462, Cl. 36-92.000.
Cavitt, Michael B.: *See*—
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Celanese Corporation: *See*—
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Cenegy, Louis F. Method for protecting a substrate with a multi-density composite polyurethane. 4,507,336, Cl. 427-244.000.
Centre National de la Recherche Scientifique C.N.R.S.: *See*—
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Challenge Cook Bros., Inc.: *See*—
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Champion International Corporation: *See*—
Lillibridge, Harold R., 4,506,452, Cl. 34-1.000.
McCay, Johnny A.; Owens, Arthur H.; and Pfaffman, Jeffrey S., 4,506,575, Cl. 83-368.000.
Roccaforte, Harry L., 4,506,816, Cl. 225-48.000.
Chandler Engineering Company: *See*—
Rose, Walter D., 4,506,542, Cl. 73-38.000.
Chang, Chang. Parallel mass spectrometer. 4,507,555, Cl. 250-281.000.
Chang, Chieh; and Lee, Man S., to GTE Lenkurt Incorporated. Switched capacitor SSB modulator. 4,507,626, Cl. 332-31.00R.
Chang, Chieh: *See*—
Lee, Man S.; and Chang, Chieh, 4,507,625, Cl. 332-31.00R.
Chapin, John T.; and Sabia, Raffaele A., to AT&T Bell Laboratories. Restorative spray coating for insulated copper conductors. 4,507,362, Cl. 428-383.000.
Chaplin, John B., to Textron, Inc. Propeller and keel arrangement for surface effect ships. 4,506,618, Cl. 114-67.00A.
Charveron, Marie: *See*—
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Chasar, Dwight W., to B. F. Goodrich Company, The. 2,4,6-Tris(substituted phenoxy)-1,3,5,2,4,6-trioxatriphosphorinanes as stabilizers. 4,507,416, Cl. 524-101.000.
Chassaing, Jacques, to Adidas Fabrique de Chassures de Sport. Pedal block for cycle shoes. 4,506,463, Cl. 36-131.000.
Chaudot, Gerard. Operating system for increasing the recovery of fluids from a deposit, simplifying production and processing installations, and facilitating operations with enhanced safety. 4,506,735, Cl. 166-357.000.
Cheek, Robert H. Cleaning composition and method. 4,507,155, Cl. 134-6.000.
Chemie und Filter GmbH: *See*—
Wally, Michael, 4,507,062, Cl. 417-413.000.
Chen, Fang-Chung: *See*—
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Chester, Thomas M. Scalp massager. 4,506,659, Cl. 128-52.000.
Chevron Research Company: *See*—
Buss, Waldeen C., 4,507,397, Cl. 502-38.000.
Devries, Louis; and Ryason, P. R., 4,507,517, Cl. 585-415.000.
Hickson, Donald A., 4,507,396, Cl. 502-8.000.
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,507,195, Cl. 208-11.00R.
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Susuki, Tosaku, to Toray Industries, Inc. Process for producing lactam/polyol block copolymer. 4,507,465, Cl. 528-312.000.
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Chicago Bridge & Iron Company: *See*—
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Chief Industries, Inc.: *See*—
Aldrich, Roger, 4,506,449, Cl. 33-288.000.
Childers, Roger K.; Buchanan, Kenneth L.; Barnette, Randall; and Buchanan, Delbert L. High-speed coin sorting and counting apparatus. 4,506,685, Cl. 133-3.00A.

Chin, Bryan A.: *See*—
Bauer, Roger E.; Straalsund, Jerry L.; and Chin, Bryan A., 4,507,227, Cl. 252-626.000.
Chisso Corporation: *See*—
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Chomerics, Inc.: *See*—
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Chow, Sui W.; and Smith, Donald F., Jr., to Union Carbide Corporation. Polyoxyalkyleneamine modified epoxy coatings for corroded metal surfaces. 4,507,363, Cl. 428-418.000.
Christensen, Joergen A.: *See*—
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Christopher, Lauren A.; and Sprague, David L., to RCA Corporation. Digital filter overflow sensor. 4,507,725, Cl. 364-724.000.
Chrysler Corporation: *See*—
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Chu, Yuan C., to Thiokol Corporation. Ultraviolet curable formulations containing urethane acrylate monomers. 4,507,188, Cl. 204-159.230.
Chuang, Yung-Ho. Cigarette box with self-lighting device and lighter. 4,507,704, Cl. 361-264.000.
Chubb Fire Security Limited: *See*—
Evans, John L.; and Bains, Kuldip, 4,506,738, Cl. 169-24.000.
Chubb & Son's Lock and Safe Company Limited: *See*—
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Chugai Seiyaku Kabushiki Kaisha: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.
Church, William H.; and Teichman, James E. Load-tilt attachment employing a pinion gear arrangement. 4,507,041, Cl. 414-641.000.
Ciba-Geigy AG: *See*—
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Ciba-Geigy Corporation: *See*—
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Balliello, Paolo, 4,507,126, Cl. 8-526.000.
Demmer, Christopher G., 4,507,446, Cl. 525-523.000.
Orban, Ivan, 4,507,463, Cl. 528-279.000.
Puntener, Alois; and Beffa, Fabio, 4,507,124, Cl. 534-695.000.
Puntener, Alois; and Koller, Josef, 4,507,125, Cl. 8-437.000.
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Seiler, Herbert; and Hegar, Gert, 4,507,236, Cl. 534-634.000.
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Vlattas, Isidoros, 4,507,311, Cl. 260-239.0BD.
Cibelli, Anthony H.: *See*—
Jacobson, Walter E.; and Cibelli, Anthony H., 4,506,557, Cl. 73-862.650.
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Rosch, Hubert J., III, 4,506,687, Cl. 134-83.000.
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Hashimoto, Shingo; and Sekine, Mitsuo, 4,507,572, Cl. 307-296.00R.
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Clairol Incorporated: *See*—
DeMarco, Richard; and Ferguson, John A., 4,507,278, Cl. 424-62.000.
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Itoh, Tsukasa, 4,506,443, Cl. 29-840.000.
Clark Equipment Company: *See*—
Siewert, Robert L.; and Varnelis, Edmund K., 4,507,005, Cl. 403-16.000.
Clark, John I.; and Wologodzew, Leo, to Pitney Bowes Inc. Eccentric pulley for inelastic timing belt. 4,507,104, Cl. 474-112.000.
Clark, Peter D.: *See*—
Hyne, James B.; and Clark, Peter D., 4,506,733, Cl. 166-303.000.
Clark-Reliance Corp., The: *See*—
Goellner, Allan R., 4,507,521, Cl. 174-151.000.
Clark, Richard W.: *See*—
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Clarke, Donald A.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,506,980, Cl. 356-237.000.
Clarke, Ronald L. C.; and Savage, Donald S., to Avdel Limited. Jaw assembly for blind riveting. 4,506,536, Cl. 72-391.000.
Classic Corporation: *See*—
Fogel, Isaac; and Keefer, Donald W., 4,506,397, Cl. 5-451.000.
Claudius Peters AG: *See*—
Buchfink, Adolf, 4,506,985, Cl. 366-107.000.
Clay, Ambrose W. J. Disposable sponge. 4,506,404, Cl. 15-244.00C.
Cledid S.A.: *See*—
Vial, Raymond, 4,506,724, Cl. 164-436.000.
Coaton, James R.; and Hussey, Douglas, to Thorn EMI plc. Discharge lamp with metal coil electrode support inserted into cermet end cap. 4,507,584, Cl. 313-624.000.
Coca-Cola Company, The: *See*—
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Cochrane, Michael W., to White Consolidated Industries, Inc. Control circuit for gas heated appliance. 4,506,458, Cl. 34-48.000.
Coers, Don H.; and Crawford, John T., to Chicago Bridge & Iron Company. Apparatus and method for condensing steam. 4,506,508, Cl. 60-652.000.
Cohen, Martin G.: *See*—
Daly, Richard T.; Cohen, Martin G.; and Kumar, Binod, 4,507,787, Cl. 372-62.000.
Colbrese, Nick P., to Safe-T-Plug, Inc. Automotive/home power interconnection system. 4,507,726, Cl. 363-13.000.
Cole, Edward H., Jr., to Borg-Warner Corporation. Power transmission chain. 4,507,106, Cl. 474-215.000.
Coleman, Douglas L.; and Applezweig, Norman, to Progenics, Inc.; and Jackson Laboratory, The. Treatment of diabetes and other symptoms of hypercorticoidism using a synergistic combination of etiocholanolones and estrogen. 4,507,289, Cl. 514-170.000.
Collins, Albert V.; and Asmus, Richard W., to Mooney Chemicals, Inc. Fungicidal and insecticidal compositions for treating wood. 4,507,152, Cl. 106-18.310.
Columbus Show Case Company, The: *See*—
Aschinger, William T.; Pfeifer, Jack F.; and Shumaker, Dale E., 4,507,714, Cl. 362-126.000.
Combustion Engineering, Inc.: *See*—
Deve, Vagn, 4,507,081, Cl. 432-106.000.
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Aubert, Michel; and Renaux, Charley, 4,507,261, Cl. 376-270.000.
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Buisson, Jacques; and Loitiere, Alain, 4,507,620, Cl. 330-307.000.
Commissariat a l'Energie Atomique: *See*—
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Compagnie Francaise des Petroles: *See*—
Quin, Rene A.; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, 4,506,863, Cl. 251-149.900.
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Bartlett, Gary F.; and Olsen, Robert W., 4,506,484, Cl. 52-476.000.
Conveyor Maintenance & Supply, Inc.: *See*—
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Conway, John H.; and Sloane, Neil J. A., to AT&T Bell Laboratories. Decoding technique for multidimensional codes. 4,507,648, Cl. 340-347.0DD.
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Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., 4,507,315, Cl. 514-396.000.
Cook, Lee M.: *See*—
Kassner, Reinhard; Mader, Karl-Heinz; and Cook, Lee M., 4,507,393, Cl. 501-75.000.
Coons, Terry L., to Tech Development Inc. Hoop turbine. 4,507,047, Cl. 415-9.000.
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Cooper, Clifford W. Binocular trainer. 4,506,963, Cl. 351-203.000.
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Trenkler, George; and Cooper, Lawrence E., 4,507,639, Cl. 336-115.000.
Cooper, Thomas F.: *See*—
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Corcoran, John J.; and Fraijo, John P. Apparatus and method for filling trenches in paved surfaces. 4,507,012, Cl. 404-72.000.
Cordis Corporation: *See*—
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Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,507,493, Cl. 560-103.000.
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Morse, Theodore F., 4,507,135, Cl. 65-3.120.
Rittler, Hermann L., 4,507,392, Cl. 501-4.000.
Correll, Ronald E., to Tektronix, Inc. Traveling wave push-pull electron beam deflector with pitch compensation. 4,507,586, Cl. 315-3.000.
Corsette, Douglas F., to Calmar, Inc. Dispensing fitment for squeeze bottles. 4,506,809, Cl. 222-213.000.
Cosden Technology, Inc.: *See*—
Hahn, Granville J.; Rutledge, Raleigh N.; and Murley, Jackie D., 4,507,071, Cl. 425-133.100.
Cosmos, Pete; and Myers, Earl C., Jr., to AMP Incorporated. Latching-grounding blocks. 4,506,937, Cl. 339-14.00R.
Cosse, Guy; and Serres, Bernard. Memory device for lighting control purposes. 4,507,655, Cl. 340-641.000.
Cotton, John M., to International Telephone and Telegraph Corporation. Associative processor with variable length fast multiply capability. 4,507,748, Cl. 364-749.000.
Counoupas, Steve S.: *See*—
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Courtaulds PLC: *See*—
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Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, to Pierre Fabre S.A. 1-Aryl 2-aminomethyl cyclopropane carboxylates (Z) as drugs in the treatment of pain. 4,507,318, Cl. 514-531.000.

Coutant, Alan R., to Ford Motor Company. Automatic transmission control pressure regulator. 4,506,564, Cl. 74-869.000.

Cowan, Dwaine O.: *See*—
Potember, Richard S.; Poehler, Theodore O.; and Cowan, Dwaine O., 4,507,672, Cl. 357-8.000.

Cowell, Gary K.; and DiGuiseppe, Carl P., to United States of America, Energy. Axially staggered seed-blanket reactor fuel module construction. 4,507,259, Cl. 376-173.000.

Crabbe, Pierre: *See*—
Archer, Sydney; Benagiano, Giuseppe; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,507,290, Cl. 514-172.000.

Crawford, Dennis L.; and Mitchell, Donald J., to Minnesota Mining and Manufacturing Company. Mat board cutter with knife blade securing safety pin. 4,506,576, Cl. 83-455.000.

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Crea, Dominic: *See*—
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Cremonesi, Pietro; and Sportoletti, Giancarlo, to Italfarmaco S.P.A. Process for the purification of glucosaminoglucans. 4,507,205, Cl. 210-638.000.

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Monkovic, Ivo; and Crenshaw, Ronnie R., 4,507,485, Cl. 546-210.000.

Cross, Bert S. Method of repairing damaged entrance to a birdhouse. 4,506,629, Cl. 119-23.000.

Crossley, Ronald L., to United States Surgical Corporation. Two-part surgical fastener applying apparatus with frangible member. 4,506,670, Cl. 128-334.00R.

Crossman, Richard B. Viewing device. 4,506,950, Cl. 350-238.000.

Crum, Michael A., to Leggett & Platt, Incorporated. Footrest mechanism for a reclining chair. 4,506,925, Cl. 297-69.000.

Cuisinarts Research & Development, Inc.: *See*—
Williams, James E., 4,506,836, Cl. 241-37.500.

Culp, Randolph A.: *See*—
Noakes, John E.; and Culp, Randolph A., 4,507,226, Cl. 252-600.000.

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Culpepper & Wilson, Inc.: *See*—
Culpepper, Bertram C., Jr.; and Wilson, Richard C., 4,506,486, Cl. 52-529.000.

Cunningham, Jock B., to Mount Isa Mines Limited. Measurement of bulk density of particulate materials. 4,506,541, Cl. 73-32.00R.

Curran, William F. Massaging device. 4,506,660, Cl. 128-57.000.

Custom Touch Electronics: *See*—
Abrahamson, John C., 4,507,644, Cl. 340-64.000.

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Schafer, David E.; and Czajkowski, Albert J., 4,507,143, Cl. 71-87.000.

Daccord, Gerard; Lemanczyk, Richard; and Vercaemer, Claude, to Etudes et Fabrication Dowell Schlumberger. Method for obtaining gelled hydrocarbon compositions, the compositions according to said method and their application in the hydraulic fracturing of underground formations. 4,507,213, Cl. 252-8.55R.

Daghe, Joseph L.; and Sands, Robert E., to Mueller Co. Relief valve assembly for use with backflow preventers. 4,506,694, Cl. 137-218.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,507,468, Cl. 528-388.000.

Daishin Kagaku Kogyo Kabushiki Kaisha: *See*—
Tsuruta, Hirobumi; and Kondo, Kiichi, 4,507,383, Cl. 430-275.000.

Dallas, Donald. Magnetic cassette for radiographic film material. 4,506,788, Cl. 206-455.000.

Daly, Richard T.; Cohen, Martin G.; and Kumar, Binod, to Quantronix Corporation. Segmented YAG laser rods and methods of manufacture. 4,507,787, Cl. 372-62.000.

Daly, Richard T.; Rhoades, Walter; Stone, Harvey; and Kaplan, Robert A., to Quantronix Corporation. YAG Laser system. 4,507,789, Cl. 372-92.000.

Dameron, Robert D.: *See*—
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Danfoss A/S: *See*—
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Daniels, Colin J.: *See*—
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Daniels, John Y.: *See*—
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Daniels, Steven D.; Stoneham, Jeffrey R.; and Erickson, John K., to Eastman Kodak Company. Light reflector apparatus and method of making. 4,507,254, Cl. 264-1.900.

Darnell, William R.: *See*—
Jackson, Winston J., Jr.; and Darnell, William R., 4,507,256, Cl. 264-54.000.

Darnois, Gilbert: *See*—
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Daugart, Heinz: *See*—
Flach, Jurgen, deceased; Opitz, Rigobert; Daugart, Heinz; and Baden, Hans-Gunter, 4,507,608, Cl. 324-220.000.

Daughton, Christian G.; and Sakaji, Richard H., to United States of America, Energy. High pressure liquid chromatographic gradient mixer. 4,506,987, Cl. 366-160.000.

David, Bernd: *See*—
Griesenbrock, Karl-Heinz; David, Bernd; and Petersen, Carsten, 4,506,764, Cl. 187-9.00E.

Davidson, Thomas A.; and Murray, Robert J., to Pennwalt Corporation. Pyrrolo[1,2-a]imidazoles and imidazo[1,2-a]pyridines. 4,507,481, Cl. 546-121.000.

Davis, Albert P., Jr.; Knight, Orien M.; and Stoltz, John W., to Exxon Production Research Co.; and Gearhart Industries, Inc. Drill string sub with self closing cable port valve. 4,506,729, Cl. 166-65.00M.

Davis, George A., Jr.: *See*—
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Davis, Robert A.: *See*—
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Dawson Construction Plant Limited: *See*—
Dawson, Robin, 4,506,744, Cl. 173-131.000.

Dawson, Jeffery C.: *See*—
Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., 4,507,440, Cl. 525-218.000.

Dawson, Robin, to Dawson Construction Plant Limited. Pile hammer. 4,506,744, Cl. 173-131.000.

De La Rue Systems Limited: *See*—
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Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., to Exxon Research & Engineering Co. Non-catalytic method for reducing the concentration of NO in combustion effluents by injection of ammonia at temperatures greater than about 1300 degree K. 4,507,269, Cl. 423-235.000.

Deepsea Ventures, Inc.: *See*—
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Deere & Company: *See*—
Black, Robert D., 4,506,839, Cl. 241-101.700.
Hewlitt, Robert W.; Ruff, James H.; and Haight, Aubrey E., 4,506,645, Cl. 123-470.000.
Kramer, Kenneth D., 4,506,700, Cl. 137-596.160.
Lob, James P., 4,506,447, Cl. 33-181.00R.
Treichel, Richard; and Johnson, Daniel M., 4,506,560, Cl. 74-473.00R.
Wykhuis, Lloyd A., 4,506,747, Cl. 180-62.000.

DeFreitas, Elias M., to Termolar S/A. Wide-mouthed isothermal container, equipped with an immersed pump. 4,506,812, Cl. 222-536.000.

DeGregoria, Anthony J.: *See*—
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Degussa Aktiengesellschaft: *See*—
Panster, Peter; Michel, Rudolf; Kleinschmit, Peter; and Deschler, Ulrich, 4,507,490, Cl. 556-427.000.

Delacour, Pierre; and Prost, Roger, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cryogenic liquid distributing device. 4,506,512, Cl. 62-49.000.

DelMar, Eric G., to FMC Corporation. Catalyzed Grignard coupling process. 4,507,513, Cl. 570-190.000.

DeMarco, Richard; and Ferguson, John A., to Clairol Incorporated. Low ammonia bleach compositions. 4,507,278, Cl. 424-62.000.

DeMarinis, Robert M.; Hieble, J. Paul; Kaiser, Carl; and Wilson, James W., to Smithkline Beckman Corporation. Dopaminergic agonist N,N-di-n-propyl-4-hydroxy-3-methanesulfonamidophenethylamine. 4,507,320, Cl. 514-605.000.

Demmer, Christopher G., to Ciba-Geigy Corporation. Water-soluble or water-dispersible resinous sulphur or phosphorus containing salts, their preparation, and their use in coatings. 4,507,446, Cl. 525-523.000.

Demmin, Timothy R.: *See*—
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Denneny, James A., Jr.: *See*—
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Dennhardt, Werner, to Seitz Enginger Noll Maschinenbau Aktiengesellschaft. Capacitor and filling-level signal indicator for filling element of container-filling machines for dispensing non-carbonated or carbonated liquids. 4,506,709, Cl. 141-95.000.

Denni, Raymond: *See*—
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Densaburo Sakai: *See*—
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Dent, Hugh R., to Sterimatic Holdings Limited. Fitments for injection devices. 4,507,118, Cl. 604-198.000.

Derata Corporation: *See*—
Dunlap, Kenneth W., 4,507,113, Cl. 604-71.000.

Deschler, Ulrich: *See*—
Panster, Peter; Michel, Rudolf; Kleinschmit, Peter; and Deschler, Ulrich, 4,507,490, Cl. 556-427.000.

Desmond, Jean-Luc. Stringed instrument. 4,506,585, Cl. 84-298.000.
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DeVall, Donald L.; DeVall, Hu D.; and Tennant, Clarence L. Apparatus for repairing chains. 4,506,501, Cl. 59-7.000.
DeVall, Hu D.: *See—*
DeVall, Donald L.; DeVall, Hu D.; and Tennant, Clarence L., 4,506,501, Cl. 59-7.000.
Deve, Vagn, to Combustion Engineering, Inc. Apparatus with heat exchange means for treating solid, granular and aggregate materials. 4,507,081, Cl. 432-106.000.
Devoise-Lambert, Andre ; and Gisi, Ulrich, to Sandoz Ltd. Fungicides containing CYMOXANIL and an oxazolidenylacetamide. 4,507,310, Cl. 514-376.000.
Devries, Louis; and Ryason, P. R., to Chevron Research Company. Conversions of low molecular weight hydrocarbons to higher molecular weight hydrocarbons using a boron compound containing catalyst. 4,507,517, Cl. 585-415.000.
Dewald, James R.: *See—*
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Dewan, Shashi B.; and Adams, Graham R., to Park-Ohio Industries, Inc. Method and apparatus for controlling the power factor of a resonant inverter. 4,507,722, Cl. 363-79.000.
de Wet, Ernest P. Exercising device and method. 4,506,885, Cl. 272-128.000.
Dezenberg, George J.; and Cooper, Charles E., Jr., to United States of America, Army. Push-pull pulsed gas laser. 4,507,786, Cl. 372-33.000.
Diatec Polymers: *See—*
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DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., to Hussmann Corporation. Oil separator unit. 4,506,523, Cl. 62-470.000.
Diczfalusy, Egon: *See—*
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Diesel Kiki Co., Ltd.: *See—*
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Cowell, Gary K.; and DiGuiseppe, Carl P., 4,507,259, Cl. 376-173.000.
Dijkstra, Jan; and Roza, Engel, to U.S. Philips Corporation. Amplifier with signal-dependent voltage supply source. 4,507,619, Cl. 330-297.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, to RCA Corporation. Flash A/D converter having reduced input loading. 4,507,649, Cl. 340-347.0AD.
Dion, Eric P., to Mobil Oil Corporation. Method for identifying nonmagnetic minerals in earth formations utilizing magnetic susceptibility measurements. 4,507,613, Cl. 324-340.000.
Dippold, Wolfgang G.: *See—*
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Dir, Gary A., to Xerox Corporation. Multicolor liquid crystal display with a dead front. 4,506,956, Cl. 350-339.00F.
Dischert, Robert A.; and Williams, James J., Jr., to RCA Corporation. Digital matrixing system. 4,507,676, Cl. 358-30.000.
Dixon, Christopher J.; and Jenkins, Stuart M., to De La Rue Systems Limited. Sheet handling machines. 4,506,880, Cl. 271-263.000.
Dixon, Glen J. Preparation and method for the treatment of acne. 4,507,287, Cl. 514-43.000.
Djerassi, Carl: *See—*
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Doboy Packaging Machinery, Inc.: *See—*
Matt, Timothy S.; and Wensink, James B., 4,506,488, Cl. 53-55.000.
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Doi, Yoshihiko; Maeda, Yoshiki; and Kobayashi, Mitsunori, to Sumitomo Electric Industries, Ltd. Process of physical vapor deposition. 4,507,189, Cl. 204-192.00N.
Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John. Method of making replaceable lamp unit for automotive headlight. 4,507,712, Cl. 362-61.000.
Dolby Laboratories Licensing Corporation: *See—*
Gundry, Kenneth J., 4,507,791, Cl. 375-27.000.
Dominique, Harry P.: *See—*
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Doner, Douglas E.: *See—*
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Donnelly, Frank, to Spiniello Construction Company. Trowel for smoothing mortar on the interior of a pipe. 4,506,624, Cl. 118-105.000.
Dore, Jacques P.; and Guerlet, Bernard G. J., to Automobiles Citroen and Automobiles Peugeot. Universal joint having roller tracks supported by resilient members. 4,507,100, Cl. 464-111.000.
Dougherty, Edward F.; Scates, Mark O.; and Paul, James L., to Celanese Corporation. Process for production of ethyl acrylate. 4,507,495, Cl. 560-205.000.
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Doup, Leonard W., to Toro Company, The. Electromechanical irrigation controller. 4,506,702, Cl. 137-624.200.
Douty, George H.: *See—*
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,506,940, Cl. 339-17.0LC.
Dow Chemical Company, The: *See—*
Blake, Donald M., Jr., 4,507,426, Cl. 524-505.000.
Falardeau, Edward R.; Frisch, Kurt C., Jr.; and Lock, Michele R., 4,507,410, Cl. 523-211.000.
Hickner, Richard A.; and Cavitt, Michael B., 4,507,412, Cl. 523-454.000.
Jakubowski, James J., 4,507,409, Cl. 523-205.000.
Kamp, Arthur J., 4,506,543, Cl. 73-61.00R.
Thomas, Robert C.; Caldwell, Robert D.; and Doner, Douglas E., 4,507,183, Cl. 204-98.000.
Woo, Edmund P., 4,507,492, Cl. 560-64.000.
Dow Chemical Corporation, The: *See—*
Tomalia, Donald A.; and Dewald, James R., 4,507,466, Cl. 528-332.000.
Dow Corning Corporation: *See—*
Tangney, Thomas J.; and Ziemelis, Maris J., 4,507,455, Cl. 528-26.000.
Downey, William L., to Schlage Lock Company. Releasable hold-open device for a door closer. 4,506,407, Cl. 16-48.500.
Doyle, Stephen D.; and Bulso, Joseph D., Jr., to Redicon Corporation. Method and apparatus for removing drawn container from draw horn. 4,506,534, Cl. 72-345.000.
Dravo Corporation: *See—*
Briggs, Aubrey C., 4,506,781, Cl. 198-711.000.
Dresser Industries, Inc: *See—*
Nick, Charles F., 4,506,504, Cl. 60-39.281.
Dresser Industries, Inc.: *See—*
Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., 4,507,440, Cl. 525-218.000.
Oliver, Donald W.; and Fertl, Walter H., 4,507,553, Cl. 250-270.000.
Roesner, Raymond E.; and Sloan, Mark L., 4,507,552, Cl. 250-259.000.
Dria, Dennis E.; Bremer, Noel J.; Dria, Myra A.; and McKain, Rodger W., to Standard Oil Company, The. Nitrile compounds as oil field biocides. 4,507,212, Cl. 252-8.55D.
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Dria, Dennis E.; Bremer, Noel J.; Dria, Myra A.; and McKain, Rodger W., 4,507,212, Cl. 252-8.55D.
Drilling Waste, Incorporated: *See—*
Simon, Jules A.; Young, John A.; Ford, Michael D.; and Bourgeois, Harold C., 4,507,208, Cl. 210-721.000.
Drogo, Pierre L. M. Electric connector. 4,506,943, Cl. 339-90.00R.
Drowley, Clifford I.: *See—*
Kamins, Theodore I.; Bradbury, Donald R.; and Drowley, Clifford I., 4,507,158, Cl. 148-175.000.
Drumm, Manuel F.: *See—*
Higginbottom, Harold P.; and Drumm, Manuel F., 4,507,428, Cl. 524-596.000.
Dube, Ghyslain, to Alcan International Limited. Removal of impurities from molten aluminium. 4,507,150, Cl. 75-63.000.
DuBois, Chester G.: *See—*
Hunt, Paul R.; and DuBois, Chester G., 4,506,649, Cl. 123-576.000.
Dubois, Lawrence H.; and Nuzzo, Ralph G., to AT&T Bell Laboratories. Intermetallic catalyst preparation. 4,507,401, Cl. 502-242.000.
Duckworth, Roger; Johnson, Roy A.; and Lester, Timothy E., to British Petroleum Company p.l.c., The. Method of stabilization of particulate material. 4,507,177, Cl. 204-1.00R.
Duda, Homer G.: *See—*
Adair, Paul C.; Duda, Homer G.; Burkholder, Amy L.; Wright, Richard F.; and Stanley, Mary M., 4,507,381, Cl. 430-246.000.
Duffey, Craig L.: *See—*
Schieser, Warren J.; Vickers, Stanley E.; and Duffey, Craig L., 4,506,489, Cl. 53-64.000.
Duffy, James T. Fluid expansion device. 4,507,066, Cl. 418-61.00A.
Dughan, Terence G.; Farmery, George M.; and Payne, Derick A. Tubular assembly, method of preparing the assembly, apparatus for

uphill teeming which incorporates the assembly and method of casting metal. 4,506,813, Cl. 222-590.000.

Duncan, Don P., to Westvaco Corporation. Partial hydrogenation of tall oil rosin. 4,507,228, Cl. 260-97.600.

Dunlap, Kenneth W., to Derata Corporation. Hypodermic jet injector. 4,507,113, Cl. 604-71.000.

Dunlap, Raymond R.: *See*—
Hutchins, Burleigh M.; Dunlap, Raymond R.; and Abrahams, Louis, 4,507,044, Cl. 414-744.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Boeckel, John W., 4,507,110, Cl. 494-10.000.
Gaul, Milton U., Jr., 4,507,072, Cl. 425-185.000.
Parshall, George W.; and Tam, Wilson, 4,507,241, Cl. 260-396.00R.
Spencer, Dudley W. C., 4,507,119, Cl. 604-280.000.
Stewart, Charles W., 4,507,439, Cl. 525-199.000.

Durham, William M.: *See*—
Barner, Robert P., Jr.; and Durham, William M., 4,507,779, Cl. 370-100.000.

Durkan, Gerald, to Kircaldie, Randall and McNab. Method and apparatus for rectifying obstructive apnea. 4,506,666, Cl. 128-204.230.

Duron, Inc.: *See*—
Horton, Richard, 4,506,493, Cl. 53-499.000.

Durrant, James A.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Duska, Alois A. Radiographic localization technique. 4,506,676, Cl. 128-653.000.

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Rose, John A.; and Dyer, Keith, 4,507,029, Cl. 409-114.000.

E. J. Brooks Company: *See*—
Swift, Allan W., 4,506,415, Cl. 24-16.0PB.
Swift, Allan W., 4,506,921, Cl. 292-318.000.

E-MU Systems, Inc.: *See*—
Rossum, David P., 4,506,579, Cl. 84-1.010.

East/West Industries, Inc.: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,506,862, Cl. 251-149.500.

Eastman Kodak Company: *See*—
Alexandrovich, Peter S., 4,507,377, Cl. 430-115.000.
Daniels, Steven D.; Stoneham, Jeffrey R.; and Erickson, John K., 4,507,254, Cl. 264-1.900.
Ernst, William L., 4,506,973, Cl. 355-3.0DD.
Gabrielsen, Rolf S.; Graham, Patricia A.; and Klijanowicz, James E., 4,507,479, Cl. 544-348.000.
Jackson, Winston J., Jr.; and Darnell, William R., 4,507,256, Cl. 264-54.000.
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Marchant, Alan B., 4,507,774, Cl. 369-271.000.
Stekienski, David J.; Upson, Donald A.; and Low, Howard M., 4,507,385, Cl. 430-523.000.
Tsilibes, George N., 4,507,373, Cl. 430-31.000.

Eaton, Brian M.: *See*—
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Ebara Corporation: *See*—
Higo, Tsutomu; Mizutani, Shoji; Sawada, Yasuhiro; and Kengaku, Katsumi, 4,507,265, Cl. 422-186.000.

Eberly, David S. Security device for padlocks. 4,506,528, Cl. 70-18.000.

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Ebizawa, Akio; and Nishio, Hisaharu, to NGK Spark Plug Co., Ltd. Oxygen sensor for exhaust gas of internal combustion engine. 4,507,192, Cl. 204-428.000.

Eckert, Gunter: *See*—
Stutz, Herbert; and Eckert, Gunter, 4,507,431, Cl. 524-840.000.

Edwards Alto Vuoto S.p.A.: *See*—
Rossi, Gianrico, 4,506,455, Cl. 34-5.000.

Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., to Owens-Illinois, Inc. Driven roller tube conveyor. 4,507,137, Cl. 65-109.000.

Eguchi, Takashi: *See*—
Hirota, Yutaka; and Eguchi, Takashi, 4,507,687, Cl. 358-335.000.

Egusa, Tomoyoshi, to NTN Toyo Bearing Company, Limited. Method of producing bearing devices for wheels of automobiles. 4,506,422, Cl. 29-148.40R.

Ehrlich, Victor D.: *See*—
Mahabadi, John K.; and Ehrlich, Victor D., 4,507,570, Cl. 307-273.000.

Eilertsen, Odd J.; and Svensen, Ottar H., to National Industri A/S. Neutral point plate of three-phase transformer for large secondary currents. 4,507,636, Cl. 336-12.000.

Eisai Co., Ltd.: *See*—
Kuriyama, Shizuo; and Saitoh, Mikio, 4,507,322, Cl. 514-648.000.

Ejiri, Yoshihiro: *See*—
Tatekura, Koichi; Yamamoto, Hitoshi; Nunokawa, Makoto; and Ejiri, Yoshihiro, 4,506,947, Cl. 350-96.210.

Ek, Bo R., to Fiber Dynamics AB. Method and device for dispersing material. 4,506,834, Cl. 241-1.000.

Ek, F. Donald: *See*—
Rich, Michael; and Ek, F. Donald, 4,506,856, Cl. 248-222.100.

Ekber, Boris Y.: *See*—
Bragin, Boris F.; Gladky, Petr V.; Markuntovich, Felix D.; Perepletchikov, Evgeny F.; Frumin, Isidor I.; and Ekber, Boris Y., 4,506,865, Cl. 251-366.000.

Electric Power Research Institute: *See*—
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Electrodyne Research Corp.: *See*—
Strohmeyer, Charles, Jr., 4,506,608, Cl. 110-245.000.

Elf France: *See*—
Negre, Guy; and Fayard, Jean-Claude, 4,506,636, Cl. 123-190.00A.

Elfab Corporation: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,506,438, Cl. 29-739.000.

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Nichols, Cynthia L.; Kornfeld, Edmund C.; and Schaus, John M., 4,507,478, Cl. 544-250.000.

Elliott, James J. Hanger for potted plants. 4,506,475, Cl. 47-67.000.

Elmec Corporation: *See*—
Kameya, Kazuo, 4,507,628, Cl. 333-138.000.

Ema, Shozo: *See*—
Hosono, Toshio; Sakamoto, Masayoshi; and Ema, Shozo, 4,507,694, Cl. 360-90.000.

Emhart Industries, Inc.: *See*—
Kingsbury, Charles M.; Beckwith, Bruce R.; and Messina, Anthony, 4,507,138, Cl. 65-158.000.
Walker, Richard A.; and Douglas, Robert J., 4,506,923, Cl. 294-87.100.

Empresa Cubana Importadora Y Exportadora de Productos Medicos: *See*—
Cao, Carlos M. M.; and Gonzalez, Manuel T., 4,507,277, Cl. 424-59.000.

Energy Conversion Devices, Inc.: *See*—
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, 4,507,181, Cl. 204-15.000.

Enertec: *See*—
Ley, Anthony J.; and Bazin, Alain, 4,507,624, Cl. 332-11.00D.

Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., to Cassella Aktiengesellschaft; and Dresser Industries, Inc. Cross-linkable and cross linked macromolecular compositions wherein cross-linking is by structural bridges of the formula —NR^{x}—CH=N—CO— and their preparation. 4,507,440, Cl. 525-218.000.

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Raehse, Wilfried; Kuehne, Norbert; Wuest, Willi; and Engelskirchen, Konrad, 4,507,474, Cl. 536-97.000.

Engelstoft, Mogens: *See*—
Braestrup, Claus T.; Christensen, Joergen A.; Engelstoft, Mogens; and Waetjen, Frank, 4,507,313, Cl. 514-220.000.

English Clays Lovering Pochin & Company, Ltd.: *See*—
Wall, George W.; and Jones, Glyn T., 4,507,201, Cl. 210-232.000.

Enlow, William P.: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,507,489, Cl. 549-375.000.

Enomoto, Masao, to Ichikoh Industries Limited. Motor-driven remote control mirror device with shaft portion pivot not coincident with shaft axis. 4,506,954, Cl. 350-634.000.

Eppler, Susan G.: *See*—
Moorehead, Robert M.; Eppler, Susan G.; and Anderson, Mardis V., 4,507,735, Cl. 364-422.000.

Equipment Company of America: *See*—
Thompson, Larry J., 4,506,796, Cl. 211-59.400.

Erb, Darrell M., to Advanced Micro Devices, Inc. Method of manufacturing high capacity semiconductor capacitance devices. 4,507,159, Cl. 148-190.000.

Erickson, John K.: *See*—
Daniels, Steven D.; Stoneham, Jeffrey R.; and Erickson, John K., 4,507,254, Cl. 264-1.900.

Ernst, Hans-Hellmut, to Britax-Kolb GmbH & Co. Safety belt emergency locking retractor. 4,506,844, Cl. 242-107.40A.

Ernst Leitz Wetzlar GmbH: *See*—
Machmerth, Herbert, 4,506,968, Cl. 354-286.000.

Ernst, William L., to Eastman Kodak Company. Toner concentration monitoring apparatus located behind a transparent photoconductor. 4,506,973, Cl. 355-3.0DD.

ESB Elektrostatische Spruh und Beschichtungsanlagen G.F. Vohringer GmbH: *See*—
Vohringer, Gerhard F., 4,506,625, Cl. 118-312.000.

Espey, Carl R.; and Andrews, Barney A., to Nuts, Incorporated. Method of making strut nuts. 4,506,399, Cl. 10-86.00R.

Estel Hoesch Werke Aktiengesellschaft: *See*—
Hofmann, Heinz; Striepeke, Wilhelm; Werner, Manfred; Kleinherne, Herbert; and Zillessen, Christoph, 4,507,021, Cl. 405-288.000.

Esten, Harold, to Hale Fire Pump Company. Rescue cutter tool. 4,506,445, Cl. 30-228.000.

ETA S.A., Fabriques d'Ebauches: *See*—
Guerin, Yves, 4,507,599, Cl. 318-696.000.

Etablissements Poirier: *See*—
Lambert, Jean-Pierre, 4,506,930, Cl. 297-423.000.

Etchells, Robert D.: *See*—
Grinberg, Jan; Etchells, Robert D.; Nudd, Graham R.; and Hansen, Siegfried, 4,507,726, Cl. 364-200.000.

Ethyl Corporation: *See*—
Frey, Frederick W.; and Lee, John Y., 4,507,503, Cl. 568-17.000.
Lee, John Y.; and Frey, Frederick W., 4,507,504, Cl. 568-17.000.
Nelson, Gunner E., 4,507,501, Cl. 568-17.000.
Nelson, Gunner E., 4,507,502, Cl. 568-17.000.

Etudes et Fabrication Dowell Schlumberger: *See*—
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Eubanks, Bobby G. Device having power means for re-arching or de-arching a leaf spring. 4,506,535, Cl. 72-389.000.

Evans, Evan J.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,506,438, Cl. 29-739.000.

Evans, John L.; and Bains, Kuldip, to Chubb Fire Security Limited. Liquid-projecting monitor. 4,506,738, Cl. 169-24.000.

Evans, Robert W., to Hughes Tool Company. Pressure biased seal compressor. 4,506,736, Cl. 166-387.000.

EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H.: *See*—
Ritter, Gerhard; Ritter, Klaus; Ritter, Josef; and Pollhammer, Edgar, 4,506,818, Cl. 227-67.000.

Exovir, Inc.: *See*—
Asculai, Samuel S.; and Rapp, Fred, 4,507,281, Cl. 424-85.000.

Expand-A-Line, Incorporated: *See*—
Thompson, Alan E., 4,507,019, Cl. 405-154.000.

Exxon Production Research Co.: *See*—
Davis, Albert P., Jr.; Knight, Orien M.; and Stoltz, John W., 4,506,729, Cl. 166-65.00M.
Khan, Shuaib A.; and Haliburton, James, 4,507,133, Cl. 62-29.000.

Exxon Research & Engineering Co.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,507,269, Cl. 423-235.000.
Johnston, John E.; Bloch, Ricardo; Ver Strate, Gary W.; and Song, W. R., 4,507,515, Cl. 585-12.000.
Matthias, Dan W.; and Thornton, Richard D., 4,507,000, Cl. 400-144.200.

Fabisiewicz, Gene: *See*—
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Facit Aktiebolag: *See*—
Rozsa, Kalman, 4,507,595, Cl. 318-630.000.

Fagnani, Matthew V., Jr.; and Martenas, Wayne B., to Sperry Corporation. Baffle means for forage harvesters. 4,506,840, Cl. 241-101.700.

Fair, Delbert W. High frequency reaction mass and hydraulic cylinder assembly. 4,506,758, Cl. 181-119.000.

Fair, John C.; and Ferguson, Kenneth R., to Gulf Oil Corporation. System for automatically controlling intermittent pumping of a well. 4,507,055, Cl. 417-12.000.

Falardeau, Edward R.; Frisch, Kurt C., Jr.; and Lock, Michele R., to Dow Chemical Company, The. Silica bonded tin urethane catalysts. 4,507,410, Cl. 523-211.000.

Faltin, Hans G. Braking means for moving paper products entering folders. 4,506,873, Cl. 270-46.000.

Fankhauser, Peter: *See*—
Witschi, Heinz; and Fankhauser, Peter, 4,506,481, Cl. 52-127.200.

Fantin, Giancarlo: *See*—
Rossetti, Vittorio; Dondoni, Alessandro; and Fantin, Giancarlo, 4,507,499, Cl. 564-179.000.

Fanuc Ltd.: *See*—
Nozawa, Ryoichiro; and Kawamura, Hideaki, 4,507,738, Cl. 364-474.000.

Farmery, George M.: *See*—
Dughan, Terence G.; Farmery, George M.; and Payne, Derick A., 4,506,813, Cl. 222-590.000.

Farmitalia Carlo Erba S.P.A.: *See*—
Franceschi, Giovanni; and Vioglio, Sergio, 4,507,295, Cl. 260-239.30P.

Farrar, David; and Hawe, Malcolm, to Allied Colloids Limited. Water soluble polymers and dispersions containing them. 4,507,422, Cl. 524-425.000.

Fast, Patricia E.; and Wierenga, Wendell, to Upjohn Company, The. Method for treating arthritis with 6-aryl pyrimidine compounds. 4,507,302, Cl. 514-272.000.

Fathauer, George H.; Fowler, James M., Jr.; Rylicki, Edward J.; and Mason, Edwin E., to Masco Corporation of Indiana. Electronic air filtering apparatus. 4,507,131, Cl. 55-104.000.

Fatovic, Peter, to Northern Telecom Limited. Loudspeaker enclosure arrangement for voice communication terminals. 4,506,759, Cl. 181-151.000.

Faulkenberry, Wayne J.; and Franke, Earnest A., to General Electric Company. Arrangement for connecting printed circuit boards. 4,506,939, Cl. 339-17.00C.

Faupell, Lawrence C., to Thiokol Corporation. Antirotation linkage for rocket motor nozzles and other mechanisms. 4,506,832, Cl. 239-265.350.

Fauran, Francois: *See*—
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,507,318, Cl. 514-531.000.

Fayard, Jean-Claude: *See*—
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Federal-Mogul Corporation: *See*—
Block, Dennis A., 4,506,774, Cl. 192-98.000.

Fedor, John W., to Masco Machine Incorporated. Combined torque and thrust overload responsive tool holder. 4,507,025, Cl. 408-6.000.

Feinland, Raymond: *See*—
Pohl, Stanley; Hnatchenko, Michael; and Feinland, Raymond, 4,507,280, Cl. 424-70.000.

Fenimore, Harry L. Apparatus and method for head and tail trimming booklets. 4,507,037, Cl. 412-11.000.

Ferguson, John A.: *See*—
DeMarco, Richard; and Ferguson, John A., 4,507,278, Cl. 424-62.000.

Ferguson, Kenneth R.: *See*—
Fair, John C.; and Ferguson, Kenneth R., 4,507,055, Cl. 417-12.000.

Fernandez, Ramon B.: *See*—
Mullen, Charles K.; Shepherd, Gary D.; Fernandez, Ramon B.; and Bergren, Kenneth B., 4,507,272, Cl. 423-447.400.

Ferrari, Giorgio: *See*—
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Ferrofluidics Corporation: *See*—
Raj, Kuldip, 4,506,895, Cl. 277-1.000.

Fertl, Walter H.: *See*—
Oliver, Donald W.; and Fertl, Walter H., 4,507,553, Cl. 250-270.000.

Fester, Walter; Huber, Bernd; and Wappes, Lieselotte, to Hoechst Aktiengesellschaft. Process for preparing acrylic filaments and fibers. 4,507,257, Cl. 264-78.000.

Feuerlohn, Helmut, to W. Schlafhorst & Co. Method and device for metering and injecting small amounts of fluid into the splicing air of a compressed gas thread splicing device. 4,506,497, Cl. 57-22.000.

Fiber Dynamics AB: *See*—
Ek, Bo R., 4,506,834, Cl. 241-1.000.

Fiberglas Canada Inc.: *See*—
Kucharska, Helena Z.; and Burton, Thomas M., 4,507,406, Cl. 521-85.000.

Fiddler, Maurice K. Portable sun shelter. 4,506,689, Cl. 135-109.000.

Fields, Ellis K.: *See*—
Nimry, Tayseer S.; and Fields, Ellis K., 4,507,186, Cl. 204-158.00R.

Fife Corporation: *See*—
Shelton, John J., 4,507,073, Cl. 425-466.000.

Fillard, Jean P.: *See*—
Gasiot, Jean; Braunlich, Peter F.; and Fillard, Jean P., 4,507,562, Cl. 250-484.100.

Finger, Ulrich: *See*—
Ozil, Maurice; and Finger, Ulrich, 4,507,697, Cl. 361-1.000.

Flach, Jurgen, deceased (by Flach, Marlis, executor); Opitz, Rigobert; Daugart, Heinz; and Baden, Hans-Gunter, to Rheinmetall GmbH. Method and arrangement using a pair of resonant circuits for determining and indicating the position of an uneveness in the inner surface of pipes or other types of cylindrical structures. 4,507,608, Cl. 324-220.000.

Flach, Marlis, executor: *See*—
Flach, Jurgen, deceased; Opitz, Rigobert; Daugart, Heinz; and Baden, Hans-Gunter, 4,507,608, Cl. 324-220.000.

Flatau, Carl R., to Textron, Inc. Counterbalance robot arm. 4,507,043, Cl. 414-719.000.

Flederbach, Mark; and Gallusser, David O., to Allied Corporation. Anti-decoupling mechanism for electrical connector. 4,506,942, Cl. 339-89.00M.

Fleer, Thomas P., to UMC Industries, Inc. High security credit card, system and method. 4,507,550, Cl. 235-449.000.

Fleming, John E.; and Dameron, Robert D. Illuminated level. 4,506,450, Cl. 33-366.000.

Fletcher, James; and Wooding, Michael S., to British Aerospace Public Limited Company. Aircraft configuration and control arrangement therefor. 4,506,848, Cl. 244-12.400.

Fletcher, Robert H., Jr., to United States of America, Army. Programmable matched filter for binary phase-coded signals. 4,507,746, Cl. 364-717.000.

FMC Corporation: *See*—
DelMar, Eric G., 4,507,513, Cl. 570-190.000.
Fourre, Remy D.; and Grant, William A., 4,507,541, Cl. 219-124.340.
Hammond, Stephen A., 4,506,934, Cl. 305-57.000.
Plummer, Ernest L., 4,507,317, Cl. 514-531.000.

Fogel, Isaac; and Keefer, Donald W., to Classic Corporation. Waterbed construction. 4,506,397, Cl. 5-451.000.

Fohrenkamm, Elsie A.: *See*—
Rousseau, Alan D.; Fohrenkamm, Elsie A.; and Kausch, William L., 4,507,382, Cl. 430-275.000.

Foley, William M., to McCarry, John D. Silicone hydride contact lens and polymer. 4,507,452, Cl. 526-279.000.

Forbes, Brian K.: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,507,732, Cl. 364-200.000.

Ford, Michael D.: *See*—
Simon, Jules A.; Young, John A.; Ford, Michael D.; and Bourgeois, Harold C., 4,507,208, Cl. 210-721.000.

Ford Motor Company: *See*—
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Forenade Fabriksverken: *See*—
Bjelvert, Sven; Olofsson, Goran; and Nystrom, Per, 4,506,603, Cl. 102-401.000.

Forino, Costante: *See*—
Franco, Larry J.; Franco, Jill; Forino, Margaret K.; and Forino, Costante, 4,506,769, Cl. 190-108.000.

Forino, Margaret K.: *See*—
Franco, Larry J.; Franco, Jill; Forino, Margaret K.; and Forino, Costante, 4,506,769, Cl. 190-108.000.

Fortner, Walter: *See*—
Hoyer, Otto; Antensteiner, Norbert; and Fortner, Walter, 4,506,425, Cl. 29-402.180.

Fortune, William S.; and Murray, Wayne A. Control circuit responsive to a component's varying resistance. 4,507,546, Cl. 219-497.000.

Fosco, Guido; and Schmutz, Karl, to Siemens-Albis AG. Oscillating device with capacitive displacement pickup. 4,507,623, Cl. 331-154.000.

Foster, Dean J. Balanced suspension knee brace. 4,506,661, Cl. 128-80.00C.

Foundation Control Systems, Inc.: *See*—
Murray, Clarence L.; and Bright, John T., 4,507,069, Cl. 425-59.000.

Fourre, Remy D.; and Grant, William A., to FMC Corporation. Measuring proximity of metal to an arc welding torch. 4,507,541, Cl. 219-124.340.

Fowler, James M., Jr.: *See*—
Fathauer, George H.; Fowler, James M., Jr.; Rylicki, Edward J.; and Mason, Edwin E., 4,507,131, Cl. 55-104.000.

Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., to General Electric Company. Copolymers and process for their preparation. 4,507,442, Cl. 525-439.000.

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Corcoran, John J.; and Fraijo, John P., 4,507,012, Cl. 404-72.000.

Fraioli, Joseph. Gas-fired infrared projection heater. 4,507,083, Cl. 432-227.000.

Francel, Georges. Device for simultaneous control of air flow and circulation speed for an air conditioning installation with variable air flow. 4,506,830, Cl. 236-49.000.

Franceschi, Giovanni; and Vioglio, Sergio, to Farmitalia Carlo Erba S.P.A. Preparation of azinomethyl-rifamycins. 4,507,295, Cl. 260-239.30P.

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Rossetti, Vittorio; Dondoni, Alessandro; and Fantin, Giancarlo, 4,507,499, Cl. 564-179.000.

Francke, Kurt O.; and Strand, Sten T., to Aktiebolaget Electrolux. Split pulley. 4,506,559, Cl. 74-439.000.

Franco, Jill: *See*—
Franco, Larry J.; Franco, Jill; Forino, Margaret K.; and Forino, Costante, 4,506,769, Cl. 190-108.000.

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Frank, Gilbert H. Microwave phase shifter. 4,507,629, Cl. 333-164.000.

Franke, Earnest A.: *See*—
Faulkenberry, Wayne J.; and Franke, Earnest A., 4,506,939, Cl. 339-17.00C.

Franklin, Michael L.; and Chen, Fang-Chung, to Hoffmann-La Roche Inc. Metered aerosol dispenser and method of using the dispenser. 4,506,803, Cl. 222-1.000.

Franklin, Stanley, to Briar Neckwear, Inc. Tie construction. 4,506,389, Cl. 2-144.000.

Frantz, Gene A.; and Lin, Kun-Shan, to Texas Instruments Incorporated. Electronic apparatus from a host language. 4,507,750, Cl. 364-900.000.

Fraser, Alexander G., to AT&T Bell Laboratories. First-in, first-out (FIFO) memory configuration for queue storage. 4,507,760, Cl. 365-221.000.

Freeman, Barrie A., to Ciba-Geigy AG. Method and apparatus for preparating liquid mixtures. 4,506,986, Cl. 366-142.000.

Freeman, Michael J. One way interactive multisubscriber communication system. 4,507,680, Cl. 358-86.000.

Freitas, Ayres: *See*—
Waas, Heinrich; Freitas, Ayres; Schultz, Jurgen; and Varges, Gunter, 4,506,617, Cl. 114-41.000.

Freppel, Christian, to Compagnie Generale des Etablissements Michelin. Process for preparing bimodal and multimodal polymers of conjugated dienes. 4,507,451, Cl. 526-136.000.

Freundlich, Richard A., to Polymer Projections, Inc. Container comprising a polysulfone resin layer with a cellular resin core. 4,507,338, Cl. 428-35.000.

Frey, Frederick W.; and Lee, John Y., to Ethyl Corporation. Process for preparing tertiary phosphines. 4,507,503, Cl. 568-17.000.

Frey, Frederick W.: *See*—
Lee, John Y.; and Frey, Frederick W., 4,507,504, Cl. 568-17.000.

Freze, Benjamin H., to Challenge Cook Bros., Inc. Laundry dryer. 4,507,080, Cl. 432-105.000.

Fried, Josef: *See*—
Archer, Sydney; Benagiano, Giuseppe; Crabbe, Pierre; Diczfalusy, Egon; Djerassi, Carl; and Fried, Josef, 4,507,290, Cl. 514-172.000.

Fried.Krupp Gesellschaft mit beschraenkter Haftung: *See*—
Schrodl, Hermann, 4,506,837, Cl. 241-97.000.

Friedrich, James W.: *See*—
Pace, Gary M.; and Friedrich, James W., 4,507,142, Cl. 71-83.000.

Friedrich, Ralph S.; and Naylor, Kenneth C., to Ameron, Inc. Fiber reinforced plastic pipe tee. 4,506,918, Cl. 285-156.000.

Friedrichs, Michael: *See*—
Boll, Richard; and Friedrichs, Michael, 4,507,651, Cl. 340-365.00L.

Friefrich Munch GmbH & Co. KG.: *See*—
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,507,353, Cl. 428-222.000.

Friehe, Hugo: *See*—
Lautenschlager, Hans-Heiner; Hilboll, Gerd; Friehe, Hugo; and Lohr, Josef P., 4,507,298, Cl. 514-247.000.

Friendly Ice Cream Corporation: *See*—
Tarantino, Jeffrey W., 4,507,326, Cl. 426-101.000.

Frisch, Kurt C., Jr.: *See*—
Falardeau, Edward R.; Frisch, Kurt C., Jr.; and Lock, Michele R., 4,507,410, Cl. 523-211.000.

Frizzell, Marvin L. Pump off control. 4,507,053, Cl. 417-12.000.

Frohberger, Paul-Ernst: *See*—
Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,507,141, Cl. 71-76.000.

Fromson, Howard A.; and Gracia, Robert F., to Howard A. Fromson. Security medium and secure articles and methods of making same. 4,507,349, Cl. 428-195.000.

Frost, Charles C.; and Weis, Siegfried K., to Conveyor Maintenance & Supply, Inc. Conveyor and/or chain lubrication apparatus. 4,506,763, Cl. 184-15.200.

Frumin, Isidor I.: *See*—
Bragin, Boris F.; Gladky, Petr V.; Markuntovich, Felix D.; Perepletchikov, Evgeny F.; Frumin, Isidor I.; and Ekber, Boris Y., 4,506,865, Cl. 251-366.000.

Fuji Electric Co., Ltd.: *See*—
Kazumi, Maruyama; and Yoshiyuki, Uchida, 4,507,519, Cl. 136-258.000.

Fuji Electric Corporate Research & Development Co., Ltd.: *See*—
Kazumi, Maruyama; and Yoshiyuki, Uchida, 4,507,519, Cl. 136-258.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kunihiro, 4,506,640, Cl. 123-339.000.

Fuji Photo Film Co., Ltd.: *See*—
Kato, Hisatoyo, 4,507,797, Cl. 378-165.000.
Naito, Hideki; Hara, Hiroshi; Sato, Kozo; and Yabuki, Yoshiharu, 4,507,380, Cl. 430-203.000.

Fuji Xerox Co., Ltd.: *See*—
Tan, Yoichi, 4,507,778, Cl. 370-94.000.

Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Focus detection device. 4,506,970, Cl. 354-406.000.

Fujii, Fumiaki: *See*—
Yamakido, Kazuo; Hagiwara, Shiro; and Fujii, Fumiaki, 4,507,792, Cl. 375-30.000.

Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, to Matsushita Electronics Corporation. Method for manufacturing a plastic encapsulated semiconductor device and a lead frame therefor. 4,507,675, Cl. 357-70.000.

Fujii, Katsumi: *See*—
Saito, Hiraku; Suzuki, Yasuo; Fujii, Katsumi; Miyazaki, Kaoru; and Horio, Takekazu, 4,507,233, Cl. 260-115.000.

Fujii, Masami: *See*—
Furukawa, Genzo; Sugie, Yutaka; and Fujii, Masami, 4,507,015, Cl. 404-103.000.

Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, to Taiho Pharmaceutical Company, Limited. Anti-cancer composition for delivering 5-fluorouracil. 4,507,301, Cl. 514-274.000.

Fujii, Tadatsugu: *See*—
Asano, Tadashi; Suzuki, Tadashi; and Fujii, Tadatsugu, 4,506,521, Cl. 62-238.700.

Fujikake, Masato: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; and Fujikake, Masato, 4,507,438, Cl. 525-119.000.

Fujiki, Makoto; and Takayama, Makoto, to Canon Kabushiki Kaisha. Information recording apparatus. 4,507,688, Cl. 360-13.000.

Fujikura Cable Works, Limited, The: *See*—
Takaoka, Michio; Moutai, Tsuneaki; and Miura, Isao, 4,507,358, Cl. 428-298.000.

Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Rail apparatus around reactor pressure vessel. 4,507,260, Cl. 376-249.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,507,293, Cl. 516-226.000.

Fujitsu Limited: *See*—
Nogami, Masaharu, 4,507,169, Cl. 156-606.000.
Ogawa, Tetsuya; and Toyokura, Nobuo, 4,506,434, Cl. 29-571.000.
Sakamoto, Kazushi; Okamoto, Tetsuro; and Okutani, Shigeaki, 4,507,728, Cl. 364-200.000.
Sasaki, Susumu, 4,507,617, Cl. 329-50.000.
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, 4,507,574, Cl. 307-448.000.
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Miyazaki, Haruhiko; Shiomi, Yasushi; Fujitus, Satoru; Masunaga, Katsuro; and Yanagisawa, Hiroshi, 4,507,494, Cl. 560-193.000.

Fujiwara, Yukio; Sonoyama, Seiji; and Imataki, Mitsumasa, to Mitsubishi Denki Kabushiki Kaisha. Lighting arrester with leakage current detection. 4,507,701, Cl. 361-127.000.

Fujiya, Toshimichi. Panel fastener. 4,507,010, Cl. 403-322.000.

Fukase, Yutaka, to M Group Corporation. Vibrationless percussion tool. 4,506,742, Cl. 173-4.000.

Fukuda, Tadaji: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,507,375, Cl. 430-128.000.

Fukui, Masahiro: *See*—
Inoue, Hiromichi; Fukui, Masahiro; Goto, Yasuyuki; and Tokita, Susumu, 4,507,222, Cl. 252-299.630.

Fukumitsu, Akira; and Sagara, Shigetoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Disc reproducing apparatus. 4,507,769, Cl. 369-77.200.

Fukuzawa, Takahiko: *See*—
Matsumoto, Hisayoshi; and Fukuzawa, Takahiko, 4,507,002, Cl. 400-322.000.

Funyu, Yutaka: *See*—
Sakurada, Kazuyuki; Funyu, Yutaka; Togashi, Fusao; Kanno, Toyoji; and Masuda, Toshikazu, 4,506,531, Cl. 72-8.000.

Furuhata, Takashi: *See*—
Azuma, Nobuo; Satoh, Kenji; Mohri, Katsuo; and Furuhata, Takashi, 4,507,690, Cl. 360-33.100.

Furukawa, Genzo; Sugie, Yutaka; and Fujii, Masami, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Arrangement for paving elastic surface material. 4,507,015, Cl. 404-103.000.

Furukawa, Hiroshi: *See*—
Okumura, Yoshiharu; Kamiyama, Setsuo; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,507,512, Cl. 568-897.000.

Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,507,437, Cl. 525-106.000.

Furukawa, Yoshimi: *See*—
Sano, Shoichi; and Furukawa, Yoshimi, 4,506,899, Cl. 280-91.000.

Fusion Systems Corporation: *See*—
Wood, Charles H.; and Ury, Michael G., 4,507,587, Cl. 315-39.000.

Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M. Trash seeder. 4,506,609, Cl. 111-52.000.

Fuss, Eric W.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,506,609, Cl. 111-52.000.

Fuss, Jarvis R.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,506,609, Cl. 111-52.000.

Fuss, Roy M.: *See*—
Fuss, Albert K.; Fuss, Eric W.; Fuss, Jarvis R.; and Fuss, Roy M., 4,506,609, Cl. 111-52.000.

Futamura, Setsuo: *See*—
Kunimasa, Koichi; Futamura, Setsuo; and Okada, Jun, 4,507,782, Cl. 371-32.000.

G.D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,506,779, Cl. 198-461.000.

Gaalema, Stephen D., to Hughes Aircraft Company. Backside illuminated blocked impurity band infrared detector. 4,507,674, Cl. 357-30.000.

Gabrielsen, Rolf S.; Graham, Patricia A.; and Klijanowicz, James E., to Eastman Kodak Company. Color-forming sulfonamidodiphenylamine dye precursor that produces phenazine dye. 4,507,479, Cl. 544-348.000.

Gaines, Harold S.; and Ross, Leonard C. Pneumatic apparatus for actuating metal shear. 4,506,578, Cl. 83-583.000.

Gaither, Dolphard. Sealing device for facilitating pressuring of tubeless tire. 4,506,719, Cl. 157-1.100.

Gaitten, Dorothy A., executrix: *See*—
Gaitten, Walden M., deceased, 4,506,713, Cl. 144-208.00E.

Gaitten, Walden M., deceased (by Gaitten, Dorothy A., executrix), to Kockums Cancar, Corp. Debarking machine with feed rolls having elongated members accommodating lateral movement. 4,506,713, Cl. 144-208.00E.

Gajewski, Henry M.; Vernick, Barry H.; Measells, Paul E.; and Garber, Jan W., to Baxter Travenol Laboratories, Inc. Method of storing red blood cells which minimizes both red blood cell hemolysis and exposure to blood extractable plasticizers. 4,507,387, Cl. 435-2.000.

Gallusser, David O.: *See*—
Flederbach, Mark; and Gallusser, David O., 4,506,942, Cl. 339-89.00M.

GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,506,915, Cl. 283-75.000.
Maurer, Thomas; Holbein, Hans-Jurgen; and Lass, Joseph S., 4,507,346, Cl. 428-158.000.

Garber, Jan W.: *See*—
Gajewski, Henry M.; Vernick, Barry H.; Measells, Paul E.; and Garber, Jan W., 4,507,387, Cl. 435-2.000.

Garcia, George L.; Recker, Richard D.; and Tisbo, Thomas A., to Suncast Corporation. Garden hose storage apparatus. 4,506,698, Cl. 137-355.260.

Garrett Corporation, The: *See*—
Mitchell, John D., 4,506,690, Cl. 137-1.000.
Rowland, Charles M.; and Denneny, James A., Jr., 4,506,594, Cl. 98-1.500.

Gasiot, Jean; Braunlich, Peter F.; and Fillard, Jean P. Methods for rapidly stimulating luminescent phosphors and recovering information therefrom. 4,507,562, Cl. 250-484.100.

Gaul, Milton U., Jr., to Du Pont de Nemours, E. I., and Company. Diverting plate. 4,507,072, Cl. 425-185.000.

Gawlick, Dieter; Gray, James N.; Iimura, Wallace M.; and Obermarck, Ronald L., to International Business Machines Corporation. Method and apparatus for logging journal data using a log write ahead data set. 4,507,751, Cl. 364-900.000.

Gearhart Industries, Inc.: *See*—
Davis, Albert P., Jr.; Knight, Orien M.; and Stoltz, John W., 4,506,729, Cl. 166-65.00M.

Geddes, Harold L.; and Beckstead, Dell R. Vapor fuel system internal combustion engines. 4,506,647, Cl. 123-557.000.

Gehrmann, Alfred: *See*—
Golob, Jurgen; and Gehrmann, Alfred, 4,507,006, Cl. 403-24.000.

Geiger, Kenneth H., to Labatt Brewing Company Limited. Process of brewing with an adjunct of highly fermentable sugar. 4,507,325, Cl. 426-16.000.

Geis, Heinz; Lautenschlager, Heinz; Schulte, Harmut; and Uliczka, Siegmund, to Triumph-Adler A.G. fur Buround Informationstechnik. Device for mounting the deflection rollers of a ruling means drive. 4,507,102, Cl. 474-101.000.

Geisel, Donald J., to Testamatic, Incorporated. Method and apparatus for electrical and optical inspection and testing of unpopulated printed circuit boards and other like items. 4,507,605, Cl. 324-73.0PC.

Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, to Shape Inc. Tape cassette with separate tape guide. 4,506,846, Cl. 242-199.000.

Gelardi, John: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 4,506,846, Cl. 242-199.000.

Gemert, Barry V., to PPG Industries, Inc. Sulfamoyl urea compound. 4,507,147, Cl. 71-93.000.

General Electric: *See*—
Morris, Robert A.; Kiesel, George W.; Rajotte, Paul T.; and Richards, Anthony L., 4,507,709, Cl. 361-400.000.

General Electric Company: *See*—
Axelrod, Robert J.; Campbell, John R.; and Ting, Sai-Pei, 4,507,436, Cl. 525-92.000.
Brackman, William D., Jr.; D'Atre, John D.; and Walker, Loren H., 4,507,723, Cl. 363-87.000.
Brunelle, Daniel J., 4,507,246, Cl. 260-429.500.
Faulkenberry, Wayne J.; and Franke, Earnest A., 4,506,939, Cl. 339-17.00C.
Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., 4,507,442, Cl. 525-439.000.
Karas, Bradley R.; and Baumgartner, Charles E., 4,507,262, Cl. 419-2.000.
Mendiratta, Ashok K.; and Morgan, Wayne F., 4,507,509, Cl. 568-724.000.
Oliver, James D., Jr., 4,507,157, Cl. 148-171.000.
Pardini, Franco P., 4,507,527, Cl. 200-145.000.
Smith, Peter H.; and Holub, Fred F., 4,507,529, Cl. 219-10.55A.
Smith, Peter H., 4,507,530, Cl. 219-10.55B.

General Electric Environmental Services, Inc.: *See*—
Roth, Alfred H., 4,507,130, Cl. 55-96.000.

General Motors Corporation: *See*—
Pandzik, Richard T., 4,506,517, Cl. 62-175.000.
Thompson, Douglas K., 4,507,052, Cl. 416-193.00A.

General Signal Corporation: *See*—
Schwab, Carl E., 4,506,994, Cl. 374-28.000.

Gentry, Cecil C., to Phillips Petroleum Company. Apparatus for varying shell fluid flow in shell and tube heat exchanger. 4,506,728, Cl. 165-96.000.

Gentry, Ernest B., to Otis Engineering Corporation. Wireline valve inner seal. 4,506,858, Cl. 251-1.00A.

George, Dieno: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

George, Stephen; and George, Thomas H., to Pyro Technology Corp. Refractory-binder coated fabric. 4,507,355, Cl. 428-246.000.

George, Thomas H.: *See*—
George, Stephen; and George, Thomas H., 4,507,355, Cl. 428-246.000.

Gerber Products Company: *See*—
Marion, Samuel, 4,506,928, Cl. 297-174.000.

Gerhard, Robert E., to Bank Constructors, Inc. Method of forming a prefabricated concrete panel. 4,506,428, Cl. 29-446.000.

Gerr, Stanley, to Huxley, Mark T., a part interest. Sailboat having convertible rig. 4,506,620, Cl. 114-102.000.

Geshuri Laboratories Ltd.: *See*—
Bakel, Izhak, 4,507,250, Cl. 260-502.50F.

Getgey, William F.: *See*—
Laux, Keith R.; and Getgey, William F., 4,506,894, Cl. 273-425.000.

Gettert, Hans: *See*—
Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, 4,507,274, Cl. 423-573.00R.

Gewerkschaft Sophia-Jacoba: *See*—
Buss, Dietrich; Brucher, Klaus; and Wenz, Wilhelm, 4,507,075, Cl. 431-115.000.

Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, to Nattermann & Cie GmbH. Process for the spray application of plant protective spray mixtures and packing units for concentrates. 4,506,831, Cl. 239-10.000.

Gingras, Roger. Machine for bending and shearing sheet metal. 4,506,433, Cl. 29-560.000.

Gisi, Ulrich: *See*—
Devoise-Lambert, Andre ; and Gisi, Ulrich, 4,507,310, Cl. 514-376.000.

Gislaved Aktiebolag: *See*—
Wadell, Georg, 4,506,933, Cl. 305-35.00R.

Gladky, Petr V.: *See*—
Bragin, Boris F.; Gladky, Petr V.; Markuntovich, Felix D.; Perepletchikov, Evgeny F.; Frumin, Isidor I.; and Ekber, Boris Y., 4,506,865, Cl. 251-366.000.

Glattli, Hans-Heinrich: *See*—
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Glaxo Group Limited: *See*—
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; and Carey, Linda, 4,507,296, Cl. 514-212.000.

Gleason, Henry A., III: *See*—
Jamieson, J. Scott; and Gleason, Henry A., III, 4,506,827, Cl. 236-46.00R.

Glenn, William E., to New York Institute of Technology. Matching region for damped piezoelectric ultrasonic apparatus. 4,507,582, Cl. 310-327.000.

Glennon, Timothy F., to Sundstrand Corporation. Pulse width modulated inverter for unbalanced and variable power factor loads. 4,507,724, Cl. 363-98.000.

Glover, Leon C.: *See*—
Rinde, James A.; Lopez, Eugene F.; and Glover, Leon C., 4,507,340, Cl. 428-36.000.

Gobeli, Garth W., to United States of America, Energy. Security seal. 4,506,914, Cl. 283-70.000.

Gobioff, Bruce D.: *See—*
Alvarez, Joseph A., III; Brennen, John F.; Krug, Robert W.; Gobioff, Bruce D.; and Shabe, John, 4,507,781, Cl. 370-104.000.

Godejahn, Gordon C., Jr., to Rockwell International Corporation. Process for and structure of high density VLSI circuits, having self-aligned gates and contacts for FET devices and conducting lines. 4,506,437, Cl. 29-577.00C.

Goel, Anil B.; and Throckmorton, Peter E., to Ashland Oil, Inc. Manufacture of aryl esters. 4,507,243, Cl. 260-410.500.

Goellner, Allan R., to Clark-Reliance Corp., The. High pressure electrical conductivity probe. 4,507,521, Cl. 174-151.000.

Gohara, Yoshihiro; Kanno, Masashi; and Yamashita, Ichiro, to Matsushita Electric Industrial Co., Ltd. Position determination apparatus. 4,507,523, Cl. 178-19.000.

Gohrich, Klaus; and Vogt, Heinz, to BBC Brown, Boveri & Company, Limited. System for controlling a spatially movable device. 4,507,593, Cl. 318-563.000.

Gold Star Tele-Electric Co., Ltd., Inc.: *See—*
Yun, Jin H., 4,507,524, Cl. 179-81.00B.

Goldner, Richard, to Shar Products Company. Shoulder support for violin or viola. 4,506,582, Cl. 84-280.000.

Golob, Jurgen; and Gehrmann, Alfred, to Braun Aktiengesellschaft. Quick-release mechanical coupling for a kitchen appliance. 4,507,006, Cl. 403-24.000.

Goncalves, Antonin, to L'Oreal. Dosage dispenser device. 4,506,810, Cl. 222-391.000.

Goncalves, Antonin L., to L'Oreal. Dispenser cap for a pressurized container and a corresponding unit. 4,506,808, Cl. 222-182.000.

Gonzalez, Manuel T.: *See—*
Cao, Carlos M. M.; and Gonzalez, Manuel T., 4,507,277, Cl. 424-59.000.

Good, Raymond H.: *See—*
Carbo, Adelaida L.; Good, Raymond H.; and Karas, Richard J., .4,507,339, Cl. 428-35.000.

Goodenough, John B.: *See—*
Thackeray, Michael M.; and Goodenough, John B., 4,507,371, Cl. 429-191.000.

Goodman, Alvin M., to RCA Corporation. Surface preparation for determining diffusion length by the surface photovoltage method. 4,507,334, Cl. 427-93.000.

Goodwin, Eber L.; and Zeigler, James E. L., to AM International, Inc. Sheet registering mechanism. 4,506,879, Cl. 271-238.000.

Goodyear Tire & Rubber Company, The: *See—*
Boone, Joe P.; Head, William J.; and Kitz, Steven L., 4,506,627, Cl. 118-708.000.
Thise-Fourgon, Marie-Rita, 4,506,717, Cl. 152-358.000.

Gordon, Kevin R.; Kelsey, Jeffrey R.; and Stannard, Ivan C., to British Petroleum Company Limited, The. Cross-linked polymer compositions and production thereof. 4,507,411, Cl. 523-436.000.

Gordon, Marvin; and Lichtenstein, Joseph, to Whitman Medical Corporation. Surgical scrub. 4,507,111, Cl. 604-3.000.

Goring, John O., to Scott Bader Company Limited. Accelerators for the cure of epoxy resins. 4,507,441, Cl. 525-438.000.

Gortz, Bernd: *See—*
Blau, Heinrich; Gortz, Bernd; Grohmann, Werner; Meusel, Wolfgang; Niebergall, Heribert; and Waldmann, Hermann, 4,507,703, Cl. 361-193.000.

Goto, Hitoshi: *See—*
Kikuchi, Toru; Saito, Takayuki; Kobayashi, Akihiro; and Goto, Hitoshi, 4,507,460, Cl. 525-507.000.

Goto, Tokuju: *See—*
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,507,539, Cl. 219-121.0PY.

Goto, Yasuyuki: *See—*
Inoue, Hiromichi; Fukui, Masahiro; Goto, Yasuyuki; and Tokita, Susumu, 4,507,222, Cl. 252-299.630.

Gotoh, Tatumi: *See—*
Satoh, Saburoh; Gotoh, Tatumi; Horii, Kenji; and Akiyama, Hidenori, 4,507,266, Cl. 422-186.150.

Gourbault, Maurice J., to Laboratoires Fournier S.A. Process for the preparation of α-aspartyl phenylalanine methyl ester. 4,507,231, Cl. 260-112.50R.

Gourmel, Yves: *See—*
Bellocci, Rio; Gourmel, Yves; and Pierrel, Michel, 4,506,723, Cl. 164-421.000.

Goutille, Maurice, to SCC Six-In-One Containers Co., S.A. Container. 4,506,798, Cl. 220-1.500.

Govan, Donald T. Propeller protecting devices. 4,507,091, Cl. 440-73.000.

Gozdziewicz, Zygmunt: *See—*
Wojciechowski, Jerzy; Haber, Jerzy; Gozdziewicz, Zygmunt; and Lange, Edward, 4,506,599, Cl. 99-469.000.

Gracia, Robert F.: *See—*
Fromson, Howard A.; and Gracia, Robert F., 4,507,349, Cl. 428-195.000.

Graham, Andrew C., to Mostek Corporation. Functional command for semiconductor memory. 4,507,761, Cl. 365-230.000.

Graham, Patricia A.: *See—*
Gabrielsen, Rolf S.; Graham, Patricia A.; and Klijanowicz, James E., 4,507,479, Cl. 544-348.000.

Grandini, Angelo: *See—*
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,507,635, Cl. 335-291.000.

Granning Suspensions, Inc.: *See—*
Bierens, John, 4,506,910, Cl. 280-711.000.

Grant, Herbert L., to S. S. Steiner, Inc. Mixed solvent extraction of hops. 4,507,329, Cl. 426-600.000.

Grant, William A.: *See—*
Fourre, Remy D.; and Grant, William A., 4,507,541, Cl. 219-124.340.

Grant, Willie T. Solenoid operated damper blades. 4,506,825, Cl. 236-9.00A.

Grant, Willie T. Reversible damper means. 4,506,828, Cl. 236-49.000.

Grant, Willie T. Variable speed damper means. 4,506,829, Cl. 236-49.000.

Gray, James N.: *See—*
Gawlick, Dieter; Gray, James N.; Iimura, Wallace M.; and Obermarck, Ronald L., 4,507,751, Cl. 364-900.000.

Graziani, Gabriele: *See—*
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, 4,507,308, Cl. 514-313.000.

Green, David T., to United States Surgical Corporation. Apparatus for applying two-part surgical fasteners. 4,506,671, Cl. 128-334.00R.

Greenfield, Richard M., Jr. Ground effect toy. 4,507,096, Cl. 446-176.000.

Gress, Wolfgang: *See—*
Harth, Hubert; Witthaus, Martin; and Gress, Wolfgang, 4,507,270, Cl. 423-365.000.

Grewe, Gunter P., to Tervcon Limited. Relay controlled load. 4,507,702, Cl. 361-161.000.

Griesenbrock, Karl-Heinz; David, Bernd; and Petersen, Carsten, to Jungheinrich Unternehmensverwaltung KG, Firma. Lift truck. 4,506,764, Cl. 187-9.00E.

Griesshaber, Karl H.; and Bialo, Charles A., to Ampex Corporation. Camera status and diagnostics display system. 4,507,683, Cl. 358-185.000.

Griggs, Alvie, Jr., to PeopLoungers, Inc. Reclining chair with push-button actuator mechanism. 4,506,926, Cl. 297-83.000.

Grill, Milton D. Vehicle door lock assembly. 4,506,527, Cl. 70-14.000.

Grinberg, Jan; Etchells, Robert D.; Nudd, Graham R.; and Hansen, Siegfried, to Hughes Aircraft Company. Array processor architecture utilizing modular elemental processors. 4,507,726, Cl. 364-200.000.

Grohmann, Werner: *See—*
Blau, Heinrich; Gortz, Bernd; Grohmann, Werner; Meusel, Wolfgang; Niebergall, Heribert; and Waldmann, Hermann, 4,507,703, Cl. 361-193.000.

Grollimund, Everett C., to Philip Morris Incorporated. Lens mount. 4,506,952, Cl. 350-255.000.

Gross-Given Manufacturing Company: *See—*
Lotspeich, Joseph A., 4,506,802, Cl. 221-75.000.

Grossmann, Horst, to Black & Decker Inc. Latching arrangement for power tools. 4,506,743, Cl. 173-48.000.

Grover, Donald D.: *See—*
Olson, Gene E.; Stout, Christopher B.; Grover, Donald D.; and Becker, Thomas P., 4,506,546, Cl. 73-119.00A.

Grumman Aerospace Corporation: *See—*
Star, Albert A.; and Weick, John M., 4,507,740, Cl. 364-487.000.

Grundfos A/S: *See—*
Jensen, Niels D.; and Brunsgaard, Hans O., 4,507,583, Cl. 310-338.000.

Grundmann, Jurgen: *See—*
von Rappard, Gerhard; and Grundmann, Jurgen, 4,507,244, Cl. 260-428.500.

GTE Automatic Electric Incorporated: *See—*
Adams, Tello D., 4,507,793, Cl. 375-36.000.
Perry, Thomas J., 4,507,780, Cl. 370-100.000.

GTE Communications Products Corporation: *See—*
Kapral, Christopher W., 4,507,650, Cl. 340-347.0DA.

GTE Communications Systems Corporation: *See—*
Lee, Man S.; and Chang, Chieh, 4,507,625, Cl. 332-31.00R.

GTE Laboratories Incorporated: *See—*
Kadkade, Prakash G.; and Botticelli, Charles R., 4,506,474, Cl. 47-58.000.

GTE Lenkurt Incorporated: *See—*
Chang, Chieh; and Lee, Man S., 4,507,626, Cl. 332-31.00R.

GTE Products Corporation: *See—*
Mathers, James E.; and Yale, Ramon L., 4,507,560, Cl. 250-483.100.

GTE Valeron Corporation: *See—*
Stashko, Daniel R., 4,507,024, Cl. 407-114.000.

Guelde, Ted W.: *See—*
McEwen, Stephen N.; and Guelde, Ted W., 4,507,061, Cl. 417-360.000.

Guerin, Yves, to ETA S.A., Fabriques d'Ebauches. Method and device for controlling a stepping motor. 4,507,599, Cl. 318-696.000.

Guerlet, Bernard G. J.: *See—*
Dore, Jacques P.; and Guerlet, Bernard G. J., 4,507,100, Cl. 464-111.000.

Guggenmos, Johannes: *See—*
Krappel, Alfred; Guggenmos, Johannes; and Holzmann, Josef, 4,506,643, Cl. 123-418.000.

Gulf Oil Corporation: *See—*
Fair, John C.; and Ferguson, Kenneth R., 4,507,055, Cl. 417-12.000.

Gulf Research & Development Company: *See—*
Beach, David L.; and Harrison, James J., 4,507,247, Cl. 260-446.000.

Gundry, Kenneth J., to Dolby Laboratories Licensing Corporation. Analog and digital signal apparatus. 4,507,791, Cl. 375-27.000.

Gupta, Alankar; Jenny, Robert W.; and Malone, Frank L., to Boeing Company, The. Drain apparatus for aircraft. 4,506,851, Cl. 244-129.100.

Gutschmit, Alan, to Alandale Knitting Company, Inc. Method for preparing belt end portions for spliced mechanical interconnection, belt end portions prepared thereby and spliced interconnection formed therewith. 4,506,429, Cl. 29-450.000.

Guzay, Casimir M., Jr., to Panduit Corp. Elastic cover applicator and method of applying cover. 4,506,430, Cl. 29-450.000.

Gygli Technik AG: *See*—
Bachtiger, Hans, 4,506,615, Cl. 112-262.100.

Gymer, Geoffrey E.; and Richardson, Kenneth, to Pfizer Inc. Triazole antifungal agents. 4,507,484, Cl. 546-210.000.

Haber, Jerzy: *See*—
Wojciechowski, Jerzy; Haber, Jerzy; Gozdziewicz, Zygmunt; and Lange, Edward, 4,506,599, Cl. 99-469.000.

Hagan, Russell M.: *See*—
Morse, Robert L.; and Hagan, Russell M., 4,506,519, Cl. 62-190.000.

Hageniers, Omer L.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,506,980, Cl. 356-237.000.

Haghiri-Tehrani, Yahya; and Hoppe, Joachim, to GAO Gesellschaft fur Automation und Organisation mbH. Identification card with a relief-type surface and a process for producing the same. 4,506,915, Cl. 283-75.000.

Hagiwara, Shiro: *See*—
Yamakido, Kazuo; Hagiwara, Shiro; and Fujii, Fumiaki, 4,507,792, Cl. 375-30.000.

Hahn, Granville J.; Rutledge, Raleigh N.; and Murley, Jackie D., to Cosden Technology, Inc. Coextrusion apparatus for producing multiple layered thermoplastic pipe. 4,507,071, Cl. 425-133.100.

Hahn, Marlin D. Fish skinning and scaling tool. 4,506,412, Cl. 17-62.000.

Haight, Aubrey E.: *See*—
Hewlitt, Robert W.; Ruff, James H.; and Haight, Aubrey E., 4,506,645, Cl. 123-470.000.

Haines, Richard K. Vehicular blinds. 4,506,476, Cl. 49-64.000.

Hair, Jakie A. Apparatus for sustained dispensation of a chemical agent exteriorally of an animal. 4,506,630, Cl. 119-156.000.

Hale Fire Pump Company: *See*—
Esten, Harold, 4,506,445, Cl. 30-228.000.

Haliburton, James: *See*—
Khan, Shuaib A.; and Haliburton, James, 4,507,133, Cl. 62-29.000.

Hall, Charles B.; and Mondek, Martin J., to Outboard Marine Corporation. Idle exhaust for marine propulsion systems. 4,507,092, Cl. 440-89.000.

Hall, Keith J.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Hall, Stanley J. Portable shooter's bench. 4,506,466, Cl. 42-94.000.

Halliburton Company: *See*—
Skinner, Neal G., 4,506,731, Cl. 166-113.000.

Hama, Yoshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens assembly with switching mechanism from or to zooming photographing to or from macro photographing. 4,506,959, Cl. 350-430.000.

Hamano, Isao, to Mitsubishi Denki Kabushiki Kaisha. Method for starting an electric starting motor adapted for starting an internal combustion engine. 4,507,565, Cl. 290-38.00R.

Hamasaki, Masanobu, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Welding method combining laser welding and MIG welding. 4,507,540, Cl. 219-121.0LD.

Hamlin, Inge; and Beudat, Andre , to P.S. Paging System, A.B. Radio communication system. 4,507,646, Cl. 340-310.00R.

Hammann, Ingeborg: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,507,292, Cl. 514-183.000.

Hammersand, Fred G.; and Witkowski, Anthony J., to United States of America, Energy. Method for brazing together planar and nonplanar metal members. 4,506,822, Cl. 228-200.000.

Hammond, Stephen A., to FMC Corporation. Chordal action isolation wheel assembly. 4,506,934, Cl. 305-57.000.

Hanada, Kazunori: *See*—
Tamai, Masaharu; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; Omura, Sadafumi; and Katunuma, Nobuhiko, 4,507,232, Cl. 260-112.50R.

Handi-Pac, Inc.: *See*—
Klawitter, Ronald R., 4,507,097, Cl. 446-236.000.

Haneda, Isamu; and Myooi, Tetsuo, to Sharp Kabushiki Kaisha. Calculation system utilizing definable keys. 4,507,743, Cl. 364-709.000.

Hankin, Stuart M. Body stretcher system. 4,506,884, Cl. 272-127.000.

Hanna, Marie R.: *See*—
Sprecker, Mark A.; and Hanna, Marie R., 4,507,225, Cl. 252-522.00R.

Hanon, Etienne P.: *See*—
Niebes, Paul J.; Matagne, Daniel M.; Hanon, Etienne P.; Roba, Joseph L.; and Lambelin, Georges E., 4,507,314, Cl. 514-456.000.

Hansen Arne, to Interfit, Inc. Pipe connection fitting. 4,506,917, Cl. 285-4.000.

Hansen, Craig N., to Hansen Engine Corporation. Rotary device with elliptical rotor in elliptical chamber. 4,507,067, Cl. 418-105.000.

Hansen Engine Corporation: *See*—
Hansen, Craig N., 4,507,067, Cl. 418-105.000.

Hansen, Siegfried: *See*—
Grinberg, Jan; Etchells, Robert D.; Nudd, Graham R.; and Hansen, Siegfried, 4,507,726, Cl. 364-200.000.

Hara, Hiroshi: *See*—
Naito, Hideki; Hara, Hiroshi; Sato, Kozo; and Yabuki, Yoshiharu, 4,507,380, Cl. 430-203.000.

Hara, Kiyoshi; Inoue, Yozo; and Noda, Munetaka, to Nippondenso Co., Ltd. Automatic running control method for a vehicle. 4,506,752, Cl. 180-179.000.

Hara, Kunio, to Nifco Inc. Fastener for string. 4,506,417, Cl. 24-115.00G.

Hara, Takeo; and Ito, Seiji, to Sony Corporation. Adjustable mounting for a motor on a base. 4,506,857, Cl. 248-655.000.

Hara, Takeshi: *See*—
Kato, Yoshinori; Umemoto, Naoji; Saito, Masahiko; and Hara, Takeshi, 4,507,234, Cl. 260-121.000.

Harcourt, Philip E.: *See*—
Bates, Alexander P.; and Harcourt, Philip E., 4,506,619, Cl. 114-91.000.

Hardegger, Bruno: *See*—
Bomches, Helmut; and Hardegger, Bruno, 4,507,482, Cl. 546-176.000.

Hardinge Brothers, Inc.: *See*—
Brown, Ivan R.; Bjorck, Paul M.; and Eaton, Brian M., 4,506,569, Cl. 82-2.00R.

Hardy, James E.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,507,269, Cl. 423-235.000.

Harle, Christopher N., to Norde Suspensions Limited. Load supporting beams. 4,506,908, Cl. 280-677.000.

Harmetz, Ronald: *See*—
Petrocine, David V.; and Harmetz, Ronald, 4,507,518, Cl. 585-610.000.

Harrison, James J.: *See*—
Beach, David L.; and Harrison, James J., 4,507,247, Cl. 260-446.000.

Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; Thompson, David J.; and Newton, David F., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal materials containing pleochroic anthraquinone dyes. 4,506,957, Cl. 350-349.000.

Hart, John: *See*—
Bohman, Paul; Hart, John; and Fabisiewicz, Gene, 4,507,114, Cl. 604-111.000.

Harth, Hubert; Witthaus, Martin; and Gress, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Process for the preparation of lead and zinc cyanurates. 4,507,270, Cl. 423-365.000.

Hartmann, Werner. Valve seal assembly. 4,506,864, Cl. 251-174.000.

Hartner, Hartmut: *See*—
Reiff, Friedrich; Hartner, Hartmut; Basedow, Arno; Hugenbusch, Hans-Wolfgang; Schmidt, Peter C.; and Bardonner, Hans, 4,507,511, Cl. 568-852.000.

Haruki, Kazuhito; Kohno, Takeshi; and Nagase, Yasuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sorter system for postal matter. 4,507,739, Cl. 364-478.000.

Harvey Hubbell Incorporated: *See*—
Quiogue, Honesto D., 4,507,719, Cl. 362-404.000.

Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Idling rpm feedback control method for internal combustion engines. 4,506,641, Cl. 123-339.000.

Hashimoto, Eiji: *See*—
Yamada, Masatoshi; Yasuda, Eiichi; Kimura, Masanobu; Ueda, Tatehito; and Hashimoto, Eiji, 4,506,545, Cl. 73-119.00A.

Hashimoto, Hisashi, to Sanyo Electric Co., Ltd. Battery device. 4,507,368, Cl. 429-62.000.

Hashimoto, Shingo; and Sekine, Mitsuo, to Citizen Watch Co., Ltd. Voltage sensing circuit. 4,507,572, Cl. 307-296.00R.

Haspert, John C., to United States Pipe and Foundry Company, a part interest. Method and apparatus for mining. 4,506,931, Cl. 299-1.000.

Hasuo, Masayoshi: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kojima, Kazuhisa, 4,507,450, Cl. 526-128.000.

Hata, Shun-ichi: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Hauni-Werke Korber & Co. KG.: *See*—
Baese, Horst; and Tolasch, Gerhard, 4,507,040, Cl. 414-403.000.

Haupt, Werner, to Otto Bock Orthopadische Industrie KG. Prosthetic foot. 4,506,395, Cl. 3-6.000.

Hawe, Malcolm: *See*—
Farrar, David; and Hawe, Malcolm, 4,507,422, Cl. 524-425.000.

Hayakawa, Yoshikazu, to Nissan Motor Company, Limited. Transmission housing. 4,506,561, Cl. 74-606.00R.

Hayase, Isao; Suginuma, Atsushi; and Kishi, Atsuo, to Hitachi, Ltd. Vane type rotary machine. 4,507,068, Cl. 418-150.000.

Hayase, Tokuji: *See*—
Ishikawa, Toshikatsu; Ichikawa, Hiroshi; Imai, Yoshikazu; Hayase, Tokuji; and Nagata, Yoichi, 4,507,354, Cl. 428-245.000.

Hayashi, Akira: *See*—
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Hayashi, Hirro, to Tsukuni, Yumi, a part interest. Pencil sharpener. 4,506,716, Cl. 145-3.500.

Hayashi, Tsuneyuki, to Sony Corporation. Coil for electric motor. 4,507,637, Cl. 336-65.000.

Hayden, Percy; Mee, Alec; and Wright, Donald, to Imperial Chemical Industries PLC. Process for the production of unsaturated mono- or saturated dialdehydes and acetals thereof. 4,507,508, Cl. 568-487.000.

Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; and Carey, Linda, to Glaxo Group Limited. Tetrazoles, pharmaceutical use and compositions. 4,507,296, Cl. 514-212.000.

Hayles, David C. Lens attachment for multiple imaging and vignetting. 4,506,964, Cl. 354-122.000.

Haylock, John C.: *See*—
Twilley, Ian C.; Turner, Garland L.; Saunders, Peter R.; and Haylock, John C., 4,507,361, Cl. 428-373.000.

Hazeltine Corporation: *See*—
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Head, William J.: *See*—
Boone, Joe P.; Head, William J.; and Kitz, Steven L., 4,506,627, Cl. 118-708.000.

Healthdyne, Inc.: *See*—
Russell, Donald J.; and Sanders, Michael A., 4,506,678, Cl. 128-723.000.

Heath, William F., Jr.: *See*—
Tam, James P.; Heath, William F., Jr.; and Merrifield, Robert B., 4,507,230, Cl. 260-112.50R.

Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Acetal esters. 4,507,489, Cl. 549-375.000.

Hedlund, Bo P. S.; and Arnoldsson, Erik, to Kockums Industri AB. Articulated waist terrain vehicle. 4,506,792, Cl. 212-223.000.

Hegar, Gert: *See*—
Seiler, Herbert; and Hegar, Gert, 4,507,236, Cl. 534-634.000.

Heims, Dirk; Ottermann, Hans-Gert; and Prang, Robert, to ABG-Werke GmbH. Consolidating plank for a highway finishing machine. 4,507,014, Cl. 404-102.000.

Helms, James R.: *See*—
Junker, Ralph D.; and Helms, James R., 4,506,589, Cl. 89-190.000.

Helms, Ronald L. Method for detecting surface and subsurface anomalies of the earth using vertical current measurements. 4,507,611, Cl. 324-323.000.

Hemming, Leland H., to Advanced Electromagnetics, Inc. Anechoic chamber. 4,507,660, Cl. 343-18.00A.

Henderson, Ann: *See*—
James, James R.; and Henderson, Ann, 4,507,664, Cl. 343-700.0MS.

Hendrix, James E.; and Daniels, John Y., to Springs Industries, Inc. Method of producing opaque printed textile fabrics with curing by free radical initiation and resulting printed fabrics. 4,507,350, Cl. 428-196.000.

Henkel Corporation: *See*—
Kordosky, Gary A.; Mackay, Kenneth D.; Sudderth, R. Brantley; and Sierakoski, Joseph M., 4,507,268, Cl. 423-24.000.

Henkel Kommanditgesellschaft: *See*—
Raehse, Wilfried; Kuehne, Norbert; Wuest, Willi; and Engelskirchen, Konrad, 4,507,474, Cl. 536-97.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Harth, Hubert; Witthaus, Martin; and Gress, Wolfgang, 4,507,270, Cl. 423-365.000.

Hennebutte, Georges B. Board for aquatic sports. 4,507,094, Cl. 441-65.000.

Hennessy Products, Incorporated: *See*—
Wingate, W. Jack, 4,506,800, Cl. 221-6.000.

Henneuse, Donald P.: *See*—
Brown, Alvin E.; and Henneuse, Donald P., 4,506,552, Cl. 73-861.280.

Henry Filters, Inc.: *See*—
McEwen, Stephen N.; and Guelde, Ted W., 4,507,061, Cl. 417-360.000.

Herbstler, Horst-Dieter: *See*—
Terzian, Rouben T.; and Herbstler, Horst-Dieter, 4,507,098, Cl. 446-288.000.

Herchenbach, Horst; Wolter, Albrecht; and Steinbiss, Eberhard, to Klockner-Humboldt-Wedag AG. Method and apparatus for the heat treatment of a fine grained product. 4,507,153, Cl. 106-100.000.

Hercules Incorporated: *See*—
Herring, Liles G., 4,507,165, Cl. 156-191.000.
Tom, Glenn M., 4,507,453, Cl. 526-283.000.

Herr, James E., to Kerr Glass Manufacturing Corporation. Tamper-evident closure. 4,506,795, Cl. 215-252.000.

Herrera, Juan M.: *See*—
Roper, Brett E.; and Herrera, Juan M., 4,506,623, Cl. 114-256.000.

Herring, Liles G., to Hercules Incorporated. Elastomer insulation compositions for rocket motors. 4,507,165, Cl. 156-191.000.

Herron, Maynard M., to Hesston Corporation. Drift eliminator for series hydraulic lift system on tillage implements and the like. 4,506,898, Cl. 280-43.230.

Hersom, Albert C.; Wright, Kenneth W.; and Brittain, John E., to Nestec, S.A. Canning apparatus. 4,506,600, Cl. 99-474.000.

Hertzog, Russel C.; and Nelligan, William B., to Schlumberger Technology Corporation. Method and apparatus for determining borehole and formation constituents. 4,507,554, Cl. 250-270.000.

Heseltine, Mark J., to Westland plc. Carbon fibre structures. 4,507,341, Cl. 428-78.000.

Hess, John E., II, to Conservolite, Inc. Electrical control system and driver. 4,507,569, Cl. 307-130.000.

Hesse, Wolfgang; Sattelmeyer, Richard; and Schunck, Erich, to Hoechst Aktiengesellschaft. Contact adhesives. 4,507,419, Cl. 524-327.000.

Hessel, William; Niemeyer, Wayne D.; Misra, Surya K.; and Openchowski, Richard A. Method of forming seamless drawn and ironed containers of aluminum stock. 4,506,533, Cl. 72-42.000.

Hessler, Richard O., to Thiokol Corporation. Dynamic pressure comparator. 4,506,539, Cl. 73-4.00R.

Hesston Corporation: *See*—
Herron, Maynard M., 4,506,898, Cl. 280-43.230.

Heth, Edwin M.: *See*—
Shrum, Kenneth L.; and Heth, Edwin M., 4,506,714, Cl. 144-209.00R.

Hewlett-Packard Co.: *See*—
Kamins, Theodore I.; Bradbury, Donald R.; and Drowley, Clifford I., 4,507,158, Cl. 148-175.000.

Hewlitt, Robert W.; Ruff, James H.; and Haight, Aubrey E., to Deere & Company. Load carrying assembly for an internal combustion engine. 4,506,645, Cl. 123-470.000.

Heydlauff, Bruce M.: *See*—
Hoover, Mervyn C., Jr.; and Heydlauff, Bruce M., 4,507,661, Cl. 343-351.000.

Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Combating pests with aryl N-oxalyl-N-methyl-carbamates. 4,507,292, Cl. 514-183.000.

Hickner, Richard A.; and Cavitt, Michael B., to Dow Chemical Company, The. High solids coatings from adducts of polyepoxides with polyamines and blocked polyisocyanates. 4,507,412, Cl. 523-454.000.

Hickson, Donald A., to Chevron Research Company. Solid body preparation and formation by agglomeration in an immiscible solvent. 4,507,396, Cl. 502-8.000.

Hieble, J. Paul: *See*—
DeMarinis, Robert M.; Hieble, J. Paul; Kaiser, Carl; and Wilson, James W., 4,507,320, Cl. 514-605.000.

Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Power chuck for turning machines. 4,507,031, Cl. 409-234.000.

Higginbottom, Harold P.; and Drumm, Manuel F., to Monsanto Company. Aqueous dispersions of polyamines and poly(dihydrobenzoxazines). 4,507,428, Cl. 524-596.000.

Higgs, Richard F.: *See*—
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 4,507,190, Cl. 204-206.000.

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Lautenschlager, Hans-Heiner; Hilboll, Gerd; Friehe, Hugo; and Lohr, Josef P., 4,507,298, Cl. 514-247.000.

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Ogborne, Graham E.; and Hill, Frederick J., 4,506,503, Cl. 60-39.281.

Hill, John C.: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Hillel, Arie; and Borovsky, Simcha, to IPCO Corporation. Infusion monitor. 4,507,112, Cl. 604-65.000.

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Schmidt, Paul J.; and Hung, William M., 4,507,483, Cl. 546-201.000.

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Suzuki, Junichi; Maruta, Keiji; Noborimoto, Kazutaka; and Hineno, Satoshi, 4,507,765, Cl. 369-45.000.

Hino, Takio: *See*—
Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, 4,507,514, Cl. 570-262.000.

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Koike, Naomasa; and Hiraishi, Shigetoshi, 4,507,671, Cl. 346-216.000.

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Aoyama, Masaharu; Hiraki, Shunichi; and Yonezawa, Toshio, 4,507,673, Cl. 357-23.00R.

Hiramatsu, Ryohei: *See*—
Masaki, Kazuo; and Hiramatsu, Ryohei, 4,506,701, Cl. 137-596.170.

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Hiraoka, Hiroyuki, to International Business Machines Corporation. Dry process for forming positive tone micro patterns. 4,507,331, Cl. 427-38.000.

Hiraoka, Taiji: *See*—
Horiuchi, Susumu; Hiraoka, Taiji; and Saito, Toru, 4,507,390, Cl. 436-161.000.

Hirayama, Yoshio: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,507,179, Cl. 204-58.000.

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Hirota, Yutaka; and Eguchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Horizontal sync pulse control circuit for video tape recorder utilizing pulse code modulation. 4,507,687, Cl. 358-335.000.

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Kikuchi, Toru; Saito, Takayuki; Kobayashi, Akihiro; and Goto, Hitoshi, 4,507,460, Cl. 525-507.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
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Hitachi Engineering Co., Ltd.: *See*—
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.

Hitachi Engineering Kabushiki Kaisha: *See*—
Ito, Yukio; and Koshio, Yoshihiro, 4,506,882, Cl. 271-303.000.

Hitachi, Ltd.: *See*—
Azuma, Nobuo; Satoh, Kenji; Mohri, Katsuo; and Furuhata, Takashi, 4,507,690, Cl. 360-33.100.
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.
Hayase, Isao; Suginuma, Atsushi; and Kishi, Atsuo, 4,507,068, Cl. 418-150.000.
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Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.
Inoue, Fumio; Jitsukata, Hiroshi; and Ando, Kunio, 4,507,585, Cl. 313-471.000.
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.
Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, 4,507,755, Cl. 365-36.000.
Kunimasa, Koichi; Futamura, Setsuo; and Okada, Jun, 4,507,782, Cl. 371-32.000.
Matsuda, Toshihiko; Takashi, Morihiko; and Yoshida, Mistuo, 4,507,693, Cl. 360-72.200.
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,506,646, Cl. 123-501.000.
Nakamura, Keiichi; Asao, Hiroshi; Okada, Kenichi; Wakabayashi, Yoichi; and Ochiai, Izumi, 4,506,423, Cl. 29-157.00R.
Okayama, Tsutomu, 4,507,600, Cl. 323-281.000.
Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, 4,507,046, Cl. 414-735.000.
Tabuchi, Toyoji; and Hikita, Mitsutaka, 4,507,581, Cl. 310-313.00B.
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Hitachi, Ltd: *See*—
Yasui, Tokumasa; Nakamura, Hideaki; Uchibori, Kiyofumi; Tanimura, Nobuyoshi; and Minato, Osamu, 4,507,759, Cl. 365-189.000.

Hitachi Microcomputer Eng. Ltd.: *See*—
Yasui, Tokumasa; Nakamura, Hideaki; Uchibori, Kiyofumi; Tanimura, Nobuyoshi; and Minato, Osamu, 4,507,759, Cl. 365-189.000.

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Parker, Leon; and Campman, Arthur R., 4,506,611, Cl. 112-79.00R.

Hnatchenko, Michael: *See*—
Pohl, Stanley; Hnatchenko, Michael; and Feinland, Raymond, 4,507,280, Cl. 424-70.000.

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McGee, Thomas G.; and Hockmuth, Richard L., 4,507,548, Cl. 235-94.00R.

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Hodogaya Chemical Co., Ltd.: *See*—
Niimura, Isao; Maeda, Shigeo; and Okazaki, Hideo, 4,507,237, Cl. 260-157.000.
Shimada, Shigeru; Kuroda, Akira; Tomiuga, Junichi; and Ishikawa, Shinzi, 4,507,430, Cl. 524-839.000.

Hoechst Aktiengesellschaft: *See*—
Fester, Walter; Huber, Bernd; and Wappes, Lieselotte, 4,507,257, Cl. 264-78.000.
Hesse, Wolfgang; Sattelmeyer, Richard; and Schunck, Erich, 4,507,419, Cl. 524-327.000.
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Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Klioze, Solomon S., 4,507,306, Cl. 514-291.000.

Hoegerle, Karl: *See*—
Tobler, Hans; and Hoegerle, Karl, 4,507,146, Cl. 71-92.000.

Hoff, Charles M., Jr., to B. F. Goodrich Company, The. Method for detection of blown beads in pneumatic tires. 4,506,981, Cl. 356-347.000.

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Bomches, Helmut; and Hardegger, Bruno, 4,507,482, Cl. 546-176.000.
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., 4,507,498, Cl. 562-463.000.
Franklin, Michael L.; and Chen, Fang-Chung, 4,506,803, Cl. 222-1.000.

Hofmann, Heinz; Striepeke, Wilhelm; Werner, Manfred; Kleinherne, Herbert; and Zillessen, Christoph, to Estel Hoesch Werke Aktiengesellschaft. Profile element for mining applications. 4,507,021, Cl. 405-288.000.

Hokkai Can Co., Ltd.: *See*—
Shinomiya, Tsutomu; Mori, Shigeki; and Higuchi, Hiroshi, 4,506,577, Cl. 83-499.000.

Hokko Chemical Industry Co., Ltd.: *See*—
Ozaki, Yoshiharu; Kaneko, Kimiyoshi; and Mitachi, Senshu, 4,507,245, Cl. 260-429.200.

Holbein, Hans-Jurgen: *See*—
Maurer, Thomas; Holbein, Hans-Jurgen; and Lass, Joseph S., 4,507,346, Cl. 428-158.000.

Holtmann, Gerhard: *See*—
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Holub, Fred F.: *See*—
Smith, Peter H.; and Holub, Fred F., 4,507,529, Cl. 219-10.55A.

Holzmann, Josef: *See*—
Krappel, Alfred; Guggenmos, Johannes; and Holzmann, Josef, 4,506,643, Cl. 123-418.000.

Homeyer, Bernhard: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,507,292, Cl. 514-183.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; Arai, Takeo; Sakakibara, Tatsuo; and Miyake, Noriaki, 4,506,721, Cl. 164-97.000.
Hasegawa, Shumpei, 4,506,641, Cl. 123-339.000.
Sano, Shoichi; and Furukawa, Yoshimi, 4,506,899, Cl. 280-91.000.
Yamanaga, Junichi; and Naito, Shiro, 4,506,441, Cl. 29-787.000.

Honda, Masamitsu: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Honda, Mikio: *See*—
Kambara, Koji; Misawa, Kazuo; Honda, Mikio; Matsui, Koichi; and Kohri, Kitijiro, 4,507,115, Cl. 604-135.000.

Honeywell Inc.: *See*—
Bonne, Ulrich, 4,507,558, Cl. 250-345.000.
Howard, James W.; and Abel, Irving R., 4,507,551, Cl. 250-216.000.
Lambert, Willibrordus J. S., 4,506,677, Cl. 128-697.000.

Honeywell Information Systems Inc.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., 4,507,730, Cl. 364-200.000.

Honour, John H., VII. Marine rail system. 4,507,016, Cl. 405-2.000.

Hood, Walter J., to Kent Corporation. Arbor for a strip accumulator. 4,506,841, Cl. 242-55.000.

Hoover, Mervyn C., Jr.; and Heydlauff, Bruce M., to United States of America, Navy. Interfering noise pulse eliminator and its use in a dicke type radiometer circuit. 4,507,661, Cl. 343-351.000.

Hoppe, Joachim: *See*—
Haghiri-Tehrani, Yahya; and Hoppe, Joachim, 4,506,915, Cl. 283-75.000.

Horgan, Anthony M.; Kazmaier, Peter M.; and Burt, Richard A., to Xerox Corporation. Squaraines. 4,507,480, Cl. 546-94.000.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Panic handle for doors. 4,506,922, Cl. 292-336.300.

Horii, Kenji: *See*—
Satoh, Saburoh; Gotoh, Tatumi; Horii, Kenji; and Akiyama, Hidenori, 4,507,266, Cl. 422-186.150.

Horii, Kingo; and Masui, Takatoshi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling fuel cut-off in an internal combustion engine. 4,506,638, Cl. 123-325.000.

Horiike, Satoru: *See*—
Tsuchida, Tetsuo; and Horiike, Satoru, 4,506,755, Cl. 180-227.000.

Horio, Takekazu: *See*—
Saito, Hiraku; Suzuki, Yasuo; Fujii, Katsumi; Miyazaki, Kaoru; and Horio, Takekazu, 4,507,233, Cl. 260-115.000.

Horiuchi, Susumu; Hiraoka, Taiji; and Saito, Toru, to Hitachi, Ltd. Chromatographic analysis for anions involving complexing anions with a polyhydric alcohol. 4,507,390, Cl. 436-161.000.

Horiya, Keiichi; Shiozaki, Tsugio; and Sato, Koichiro, to Tokyo Electric Company, Ltd. Thermal printer. 4,507,668, Cl. 346-76.0PH.

Horn, Don M. Vehicle hoist. 4,506,866, Cl. 254-2.00B.

Horodysky, Andrew G.: *See*—
Braid, Milton; and Horodysky, Andrew G., 4,507,216, Cl. 252-49.600.

Horton, Richard, to Duron, Inc. Case packer. 4,506,493, Cl. 53-499.000.

Hoshina, Isamu: *See*—
Shimoyama, Mamoru; and Hoshina, Isamu, 4,506,494, Cl. 53-551.000.

Hoshino, Shigeo; Takenaka, Kazuhiro; and Muro, Hideo, to Nissan Motor Company, Limited. Vibration analyzing device. 4,507,705, Cl. 361-283.000.

Hosono, Tatsukuma: *See*—
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.

Hosono, Toshio; Sakamoto, Masayoshi; and Ema, Shozo, to Pioneer Electronic Corporation. Selection/drive system for use in a tape recording/reproducing apparatus. 4,507,694, Cl. 360-90.000.

Hottinger Baldwin Measurements, Inc.: *See*—
Lockery, Harry E., 4,506,746, Cl. 177-211.000.

Houdard, Jean-Pierre; and Patte, Philippe F., to Le Materiel Telephonique Thomson-CSF. Procedure for shared-time processing of digital signals and application to a multiplexed self-adapting echo canceler. 4,507,747, Cl. 364-724.000.

Howard A. Fromson: *See*—
Fromson, Howard A.; and Gracia, Robert F., 4,507,349, Cl. 428-195.000.

Howard, Frederick S.: *See*—
Meyer, Raymond A.; Howard, Frederick S.; and Brugger, John E., 4,507,762, Cl. 367-137.000.

Howard, James W.; and Abel, Irving R., to Honeywell Inc. Optical detection system having a detector lens comprising a rear landscape lens. 4,507,551, Cl. 250-216.000.

Hoyer, Otto; Antensteiner, Norbert; and Fortner, Walter, to Voest-Alpine Aktiengesellschaft. Method for the hot repair of the protective layer provided on the permanent lining of a tundish of a continuous casting plant. 4,506,425, Cl. 29-402.180.

Hruban, Mark. Water bed sheet. 4,506,398, Cl. 5-451.000.

Hsieh, Samuel C., to Allied Corporation. Wide frequency multi-phase undervoltage detection circuit. 4,507,713, Cl. 361-92.000.

Huber, Bernd: *See*—
Fester, Walter; Huber, Bernd; and Wappes, Lieselotte, 4,507,257, Cl. 264-78.000.

Hudson, Dannie B. Adjustable orifice for emulsifier. 4,506,991, Cl. 366-341.000.

Hudson, William G., to Tioxide Group PLC. Oxidation process for production of acidic ferric sulphate. 4,507,273, Cl. 423-558.000.

Huettenes-Albertus Chemische Werke GmbH: *See*—
Torbus, Marek A.; and Vujevic, Aleksandar, 4,507,408, Cl. 523-143.000.

Huffy Corporation: *See*—
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Hugenbusch, Hans-Wolfgang: *See*—
Reiff, Friedrich; Hartner, Hartmut; Basedow, Arno; Hugenbusch, Hans-Wolfgang; Schmidt, Peter C.; and Bardonner, Hans, 4,507,511, Cl. 568-852.000.

Hughes Aircraft Company: *See*—
Adams, Gerald J.; Burkett, William L., Jr.; and Smolik, John V., 4,506,852, Cl. 244-158.00R.
Gaalema, Stephen D., 4,507,674, Cl. 357-30.000.
Grinberg, Jan; Etchells, Robert D.; Nudd, Graham R.; and Hansen, Siegfried, 4,507,726, Cl. 364-200.000.

Hughes, Geoffrey F. Method for restoring and maintaining eutrophied natural bodies of waters. 4,507,206, Cl. 210-709.000.

Hughes, Jack. Cartridge shaped barrel insert. 4,506,604, Cl. 102-446.000.

Hughes, Larry J., to Proctor & Gamble Company, The. Stable liquid detergent compositions. 4,507,219, Cl. 252-118.000.

Hughes Tool Company: *See*—
Evans, Robert W., 4,506,736, Cl. 166-387.000.
Smith, Jackie E., 4,506,432, Cl. 29-458.000.

Hula, Melvin F., Jr. Levee gate cutter. 4,506,741, Cl. 172-445.100.

Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,507,483, Cl. 546-201.000.

Hunt, Paul R.; and DuBois, Chester G., to Outboard Marine Corporation. Vent system. 4,506,649, Cl. 123-576.000.

Hunt, Ronald E.; and Jenkins, William M., to International Business Machines Corporation. Duplexing paper handling system. 4,506,881, Cl. 271-277.000.

Hurst, Boyd E.: *See*—
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,507,269, Cl. 423-235.000.

Hussey, Douglas: *See*—
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Hussmann Corporation: *See*—
DiCarlo, Leonard J.; Ares, Roland A.; and Norton, Robert O., 4,506,523, Cl. 62-470.000.

Hutchins, Burleigh M.; Dunlap, Raymond R.; and Abrahams, Louis, to Zymark Corporation. Robot and control system. 4,507,044, Cl. 414-744.00R.

Hutter, Heinrich, to U.S. Philips Corporation. Drum-shaped scanning device. 4,507,696, Cl. 360-109.000.

Hutton, Thomas W.; and Lavelle, Joseph A., to Rohm and Haas Company. Acrylic polymers solutions for use in forming a membrane for curing concrete and the like. 4,507,454, Cl. 526-317.000.

Huxley, Mark T.: *See*—
Gerr, Stanley, 4,506,620, Cl. 114-102.000.

Hyne, James B.; and Clark, Peter D., to Alberta Oil Sands Technology and Research Authority. Additive for inclusion in a heavy oil reservoir undergoing steam injection. 4,506,733, Cl. 166-303.000.

Ichikawa, Hiroshi: *See*—
Ishikawa, Toshikatsu; Ichikawa, Hiroshi; Imai, Yoshikazu; Hayase, Tokuji; and Nagata, Yoichi, 4,507,354, Cl. 428-245.000.

Ichikawa, Toshiji: *See*—
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Ichikoh Industries Limited: *See*—
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ICI Australia Limited: *See*—
Sujansky, Vladimir; Tribuzio, Sergio; and Paull, Jolanta, 4,507,161, Cl. 149-21.000.

Idea Development Company, Inc.: *See*—
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Idemitsu Kosan Company Limited: *See*—
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Igarashi, Michiaki; Inui, Takayasu; Otsuka, Kazuo; Nogami, Saburo; and Nishimura, Satoru, to Kabushiki Kaisha Komatsu Seisakusho. Control system for hydraulic pumps of a civil machine. 4,507,057, Cl. 417-216.000.

Igarashi, Sachio: *See*—
Yamazaki, Kyuya; and Igarashi, Sachio, 4,507,447, Cl. 525-528.000.

Ihnativ, Lawrence Waldemar: *See*—
Phong-Anant, Dheera, 4,506,631, Cl. 122-2.000.

Ii, Yasuaki: *See*—
Sasaki, Isao; Ii, Yasuaki; and Mori, Hiroshi, 4,507,423, Cl. 524-427.000.

Iimura, Wallace M.: *See*—
Gawlick, Dieter; Gray, James N.; Iimura, Wallace M.; and Obermarck, Ronald L., 4,507,751, Cl. 364-900.000.

Iiyama, Kiyotaka: *See*—
Motosugi, Takanori; Sakai, Hisashi; and Iiyama, Kiyotaka, 4,507,670, Cl. 346-208.000.

Ikedo, Yuji; Abe, Kunio; and Saito, Masatsugu, to Pioneer Electronic Corporation. Automatic disc loading and unloading system for recording-disc playback apparatus. 4,507,768, Cl. 369-77.100.

Illinois Tool Works Inc.: *See*—
Bury, George J., 4,507,718, Cl. 362-396.000.
Swick, Edwin G., 4,506,459, Cl. 34-110.000.

IMA-Industria Macchine Automatiche S.p.A.: *See*—
Romagnoli, Andrea, 4,506,495, Cl. 53-559.000.

Imai, Toshihiro, to Olympus Optical Co., Ltd. Compact zoom lens system. 4,506,958, Cl. 350-427.000.

Imai, Yoshikazu: *See*—
Ishikawa, Toshikatsu; Ichikawa, Hiroshi; Imai, Yoshikazu; Hayase, Tokuji; and Nagata, Yoichi, 4,507,354, Cl. 428-245.000.

Imamura, Saburo: *See*—
Morita, Masao; Tanaka, Akinobu; Imamura, Saburo; Tamamura, Toshiaki; and Kogure, Osamu, 4,507,384, Cl. 430-311.000.

Imataki, Mitsumasa: *See*—
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Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, to Mitsubishi Chemical Industries Limited; and Hitachi, Ltd. Anthraquinone dye and liquid crystal composition containing the same. 4,507,221, Cl. 252-299.100.

Imberge, Paul-Robert: *See*—
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Imperial Chemical Industries PLC: *See*—
Hayden, Percy; Mee, Alec; and Wright, Donald, 4,507,508, Cl. 568-487.000.
Sugavanam, Balasubramanyan, 4,507,140, Cl. 71-76.000.

Inaba, Norihiko: *See*—
Sakamoto, Hiroshi; Koseki, Yoshihiro; Motosugi, Takanori; and Inaba, Norihiko, 4,507,669, Cl. 346-207.000.

Inamura, Toshio: *See*—
Shimojo, Hirokazu; and Inamura, Toshio, 4,506,650, Cl. 123-620.000.

Innocent, David B., to Lucas Industries public limited company. Boot assembly. 4,506,768, Cl. 188-370.000.

Innse Innocenti Santeustacchio S.p.A.: *See*—
Adorni, Franco, 4,506,814, Cl. 222-591.000.

Inohara, Masanobu, to Asics Corporation. Sport shoe sole. 4,506,461, Cl. 36-29.000.

Inoue, Fumio; Jitsukata, Hiroshi; and Ando, Kunio, to Hitachi, Ltd. Beam-indexing color picture tube arrangement. 4,507,585, Cl. 313-471.000.

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Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,507,532, Cl. 219-69.00W.
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Inoue, Kiyoshi, 4,507,536, Cl. 219-121.0LB.

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Inoue, Tokuta: *See*—
Kanda, Mutsumi; Inoue, Tokuta; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,506,632, Cl. 123-41.350.
Inoue, Toshio: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,507,468, Cl. 528-388.000.
Inoue, Yozo: *See*—
Hara, Kiyoshi; Inoue, Yozo; and Noda, Munetaka, 4,506,752, Cl. 180-179.000.
Inowa, Shigeru: *See*—
Shukuri, Katsuhiro; Inowa, Shigeru; and Kawamoto, Kiyoaki, 4,506,975, Cl. 355-15.000.
Interfit, Inc.: *See*—
Hansen Arne, 4,506,917, Cl. 285-4.000.
International Beverage Supply, Inc.: *See*—
Muscari, Raymond F., 4,506,790, Cl. 211-59.400.
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Alvarez, Joseph A., III; Brennen, John F.; Krug, Robert W.; Gobioff, Bruce D.; and Shabe, John, 4,507,781, Cl. 370-104.000.
Baise, Arnold I.; and Wu, Anthony W., 4,507,333, Cl. 427-82.000.
Bakeman, Paul E., Jr.; and Quinn, Robert M., 4,506,436, Cl. 29-577.00C.
Barclay, Donald J., 4,507,178, Cl. 204-29.000.
Barner, Robert P., Jr.; and Durham, William M., 4,507,779, Cl. 370-100.000.
Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,507,171, Cl. 156-643.000.
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Hiraoka, Hiroyuki, 4,507,331, Cl. 427-38.000.
Hunt, Ronald E.; and Jenkins, William M., 4,506,881, Cl. 271-277.000.
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Pliskin, William A.; Riseman, Jacob; and Shepard, Joseph F., 4,506,435, Cl. 29-576.00W.
Tucker, Edwin L.; Waller, Richard H., III; and Wilson, Kenneth T., 4,507,777, Cl. 370-16.000.
International Computers Limited: *See*—
Procter, Brian J., 4,507,784, Cl. 371-61.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; and Hanna, Marie R., 4,507,225, Cl. 252-522.00R.
International Standard Electric Corporation: *See*—
Minks, Werner, 4,507,633, Cl. 335-202.000.
Parfree, Colin S.; and Worthington, Peter, 4,506,948, Cl. 350-96.230.
International Telephone and Telegraph Corporation: *See*—
Cotton, John M., 4,507,748, Cl. 364-749.000.
Inui, Takayasu: *See*—
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Inventions International Incorporated: *See*—
Stevenson, Rosemary C., 4,507,087, Cl. 434-98.000.
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Hillel, Arie; and Borovsky, Simcha, 4,507,112, Cl. 604-65.000.
Irbit Holding AG: *See*—
Tschudin-Mahrer, Rolf, 4,506,699, Cl. 137-375.000.
Irie, Kenji: *See*—
Murata, Toshio; Kushida, Hachiro; and Irie, Kenji, 4,507,184, Cl. 204-129.350.
Isayama, Katsuhiko: *See*—
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, 4,507,469, Cl. 528-425.000.
Ishida, Masaaki: *See*—
Sugiyama, Hiroyuki; and Ishida, Masaaki, 4,506,602, Cl. 101-230.000.
Ishida, Naobumi: *See*—
Micetich, Ronald J.; Yamabe, Shigeru; Ueda, Shuichi; Ishida, Naobumi; and Ishizawa, Takeshi, 4,507,239, Cl. 260-245.20R.
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Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,507,539, Cl. 219-121.0PY.
Ishiguro, Mamoru; Matsuyama, Atsuo; and Yamamura, Kazumasa, to Sony Corporation. Editing control method and apparatus for video tape recorders. 4,507,691, Cl. 360-14.300.
Ishiguro, Yoshinori: *See*—
Nakashima, Noriyuki; and Ishiguro, Yoshinori, 4,506,909, Cl. 280-707.000.
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, to Sumitomo Chemical Company, Limited. Stabilizers for synthetic resins. 4,507,417, Cl. 524-101.000.
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Italfarmaco S.P.A.: *See*—
Cremonesi, Pietro; and Sportoletti, Giancarlo, 4,507,205, Cl. 210-638.000.
Itgenhorst, Dieter: *See*—
Kutz, Johannes; Itgenhorst, Dieter; and Kohnen, Julius, 4,506,526, Cl. 68-15.000.
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, to Murata Manufacturing Co., Ltd. CATV System. 4,507,627, Cl. 333-105.000.
Ito, Seiji: *See*—
Hara, Takeo; and Ito, Seiji, 4,506,857, Cl. 248-655.000.
Ito, Yukio; and Koshio, Yoshihiro, to Musashi Co., Ltd.; and Hitachi Engineering Kabushiki Kaisha. Device for placing banknotes with their front or reverse sides facing in the same direction. 4,506,882, Cl. 271-303.000.
Itoh, Tsukasa, to Clarion Co., Ltd. Method of mounting electric part onto a substrate. 4,506,443, Cl. 29-840.000.
Itou, Takaaki: *See*—
Katou, Takashi; and Itou, Takaaki, 4,506,644, Cl. 123-439.000.
Ivy, James R. Game skinning apparatus. 4,506,411, Cl. 17-44.300.
Iwabe, Kazuki; and Noguchi, Wataru, to Hitachi Denshi Kabushiki Kaisha. Autoregistration system for color TV cameras. 4,507,678, Cl. 358-51.000.
Iwamoto, Masakuni, to Meinan Machinery Works, Inc. Glued laminated wood and method of manufacturing the same. 4,507,162, Cl. 156-157.000.
Iwanicki, Andrzej T. Insulation curtain. 4,506,720, Cl. 160-26.000.
J. E. Love Co.: *See*—
Neal, Archie E., 4,506,610, Cl. 111-87.000.
Jackson, Joseph F.; and Waite, Ralph A., to Pratt Burnerd International Limited. Chucks. 4,506,896, Cl. 279-118.000.
Jackson Laboratory, The: *See*—
Coleman, Douglas L.; and Applezweig, Norman, 4,507,289, Cl. 514-170.000.
Jackson, Richard S., to Bourn & Koch Machine Tool Company. Cam operated machining unit. 4,507,030, Cl. 409-185.000.
Jackson, Winston J., Jr.; and Darnell, William R., to Eastman Kodak Company. Process for foaming cellulose acetate rod. 4,507,256, Cl. 264-54.000.
Jacobine, Anthony F.; and Lin, Samuel O. S., to Loctite Corporation. Siloxane photoinitiators with aryoyl formate groups. 4,507,187, Cl. 204-159.130.
Jacobson, Walter E.; and Cibelli, Anthony H., to Revere Corporation of America. Load cell apparatus. 4,506,557, Cl. 73-862.650.
Jacoby, Charles E., to SI Handling Systems, Inc. Shelf-type driverless vehicle. 4,506,607, Cl. 108-60.000.
Jahme, Hans-Joachim; and Bracke, Harry. Plate changing apparatus for offset printing machines. 4,507,167, Cl. 156-345.000.
Jakubowski, James J., to Dow Chemical Company, The. Thixotropic mixtures of liquid polyesters and polymer-treated fillers. 4,507,409, Cl. 523-205.000.
Jakubson, Joel E.: *See*—
Austin, Stewart S.; Baldini, Joseph J., III; Jakubson, Joel E.; and Ryan, Clarke S., 4,507,783, Cl. 371-49.000.
Jakusch, Helmut: *See*—
Kohl, Albert; Schneider, Norbert; Ley, Gregor; Balz, Werner; Melzer, Milena; and Jakusch, Helmut, 4,507,457, Cl. 427-48.000.
James, James R.; and Henderson, Ann, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Dielectric image waveguide antenna array. 4,507,664, Cl. 343-700.0MS.
James River-Norwalk, Inc.: *See*—
Klowak, Bernard G.; and Salmeen, Nilo I., Jr., deceased, 4,507,173, Cl. 162-112.000.
Jamieson, J. Scott; and Gleason, Henry A., III, to Johnson Service Company. Battery powered thermostat. 4,506,827, Cl. 236-46.00R.
Japan Exlan Company Limited: *See*—
Tanaka, Koji; and Ueda, Minoru, 4,507,204, Cl. 210-497.01ô.
Jautelat, Manfred, to Bayer Aktiengesellschaft. Process for preparing 5-substituted 1-chloro-3,3-dimethylpentan-2-ones. 4,507,496, Cl. 560-266.000.
Jean Lassale S.A.: *See*—
Bonnet, Eric, 4,506,992, Cl. 368-282.000.
Jeanjacquot, Alain: *See*—
Belenger, Jacques; and Jeanjacquot, Alain, 4,507,048, Cl. 415-90.000.
Jeanneret, Yves; and Wenger, Jean-Louis, to Bobst SA. Device for longitudinally guiding an endless web. 4,506,782, Cl. 198-806.000.
Jeffery, Philip A. E.; and Lawrence, Thomas H., to United Technologies Corporation. Pneumatic valve control for circulation control aircraft. 4,507,050, Cl. 416-90.00A.
Jenkins, Scott A.: *See*—
Bailard, James A.; and Jenkins, Scott A., 4,506,686, Cl. 134-57.00R.
Jenkins, Stuart M.: *See*—
Dixon, Christopher J.; and Jenkins, Stuart M., 4,506,880, Cl. 271-263.000.
Jenkins, William M.: *See*—
Hunt, Ronald E.; and Jenkins, William M., 4,506,881, Cl. 271-277.000.

Jennings, Robert M.: *See*—
Karns, Albert L.; and Jennings, Robert M., 4,506,597, Cl. 99-295.000.

Jenny, Robert W.: *See*—
Gupta, Alankar; Jenny, Robert W.; and Malone, Frank L., 4,506,851, Cl. 244-129.100.

Jensen, Niels D.; and Brunsgaard, Hans O., to Grundfos A/S. Piezoelectric level detector. 4,507,583, Cl. 310-338.000.

Jensen, Richard: *See*—
Jensen, Robert; and Jensen, Richard, 4,506,571, Cl. 83-104.000.

Jensen, Robert; and Jensen, Richard. Machine for removing book bindings. 4,506,571, Cl. 83-104.000.

Jepson, Robert M.: *See*—
Cameto, L. Robert; and Jepson, Robert M., 4,506,511, Cl. 62-3.000.

Jidosha Kiki Co., Ltd.: *See*—
Shimamura, Morihiko, 4,506,592, Cl. 92-101.000.

Jim Walter Corporation: *See*—
Koenig, Alan R.; and Moon, Edward L., 4,507,197, Cl. 209-2.000.

Jitsukata, Hiroshi: *See*—
Inoue, Fumio; Jitsukata, Hiroshi; and Ando, Kunio, 4,507,585, Cl. 313-471.000.

Johansson, Ingvar: *See*—
Nord, Dan; and Johansson, Ingvar, 4,507,202, Cl. 210-391.000.

Johns Hopkins University, The: *See*—
Miller, Paul S.; and Ts'O , Paul O. P., 4,507,433, Cl. 525-54.110.
Potember, Richard S.; Poehler, Theodore O.; and Cowan, Dwaine O., 4,507,672, Cl. 357-8.000.

Johnson, Bruce W. Log splitting apparatus. 4,506,712, Cl. 144-193.00A.

Johnson, Daniel M.: *See*—
Treichel, Richard; and Johnson, Daniel M., 4,506,560, Cl. 74-473.00R.

Johnson, David A.: *See*—
Blosser, Henry G.; Johnson, David A.; Riedel, Jack; and Burleigh, Richard J., 4,507,616, Cl. 328-234.000.

Johnson & Johnson: *See*—
Levesque, Yvon, 4,507,122, Cl. 604-375.000.

Johnson & Johnson Baby Products Company: *See*—
Menard, Michael J., 4,507,163, Cl. 156-164.000.

Johnson, Ralph K.: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Johnson, Ralph K., 4,506,652, Cl. 126-21.00A.

Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., to Honeywell Information Systems Inc. Memory system with automatic memory configuration. 4,507,730, Cl. 364-200.000.

Johnson, Robert C.; and Burns, Larry E., to Proctor & Gamble Company, The. Strong laminate. 4,507,351, Cl. 428-198.000.

Johnson, Roy A.: *See*—
Duckworth, Roger; Johnson, Roy A.; and Lester, Timothy E., 4,507,177, Cl. 204-1.00R.

Johnson Service Company: *See*—
Jamieson, J. Scott; and Gleason, Henry A., III, 4,506,827, Cl. 236-46.00R.

Johnson, Terry D., to Robinson, Melvin L., a part interest. Pivotable towed snow removal blade. 4,506,465, Cl. 37-268.000.

Johnston, David B. R., to Merck & Co., Inc. N-[2-amino-5-halo-6-(substituted)-3-pyrazinyl)-methylene]amine antimicrobial compounds. 4,507,299, Cl. 514-255.000.

Johnston, Donald A.: *See*—
Jones, Stephen K.; and Johnston, Donald A., 4,507,794, Cl. 375-55.000.

Johnston, Gordon L., to Donaldson Company, Inc. Filter element. 4,507,203, Cl. 210-445.000.

Johnston, John E.; Bloch, Ricardo; Ver Strate, Gary W.; and Song, W. R., to Exxon Research & Engineering Co. Lubricating oil compositions containing ethylene-alpha-olefin polymers of controlled sequence distribution and molecular heterogeneity. 4,507,515, Cl. 585-12.000.

Jones, Cecil M., to Norton Company. Chromia-magnesia ramming cement. 4,507,395, Cl. 501-115.000.

Jones, Clarence O., Jr., to Niagara Machine & Tool Works. Punch-clamping construction for presses. 4,506,538, Cl. 72-481.000.

Jones, Daniel P., to Reliability, Inc. Burn-in clock monitor. 4,507,544, Cl. 219-209.000.

Jones, Glyn T.: *See*—
Wall, George W.; and Jones, Glyn T., 4,507,201, Cl. 210-232.000.

Jones, Howard: *See*—
Youssefyeh, Raymond D.; and Jones, Howard, 4,507,316, Cl. 514-510.000.

Jones, John D.: *See*—
Topping, Joseph R.; and Jones, John D., 4,506,448, Cl. 33-185.00R.

Jones, Stephen K.; and Johnston, Donald A. Filtered Manchester Coded PSK transmission system. 4,507,794, Cl. 375-55.000.

Joosten, Richard L.; and Davis, George A., Jr. Container sterilization apparatus and method. 4,506,491, Cl. 53-426.000.

Josefek, Kirt L. Lumbar ridge supporting. 4,506,929, Cl. 297-230.000.

Judith, Hans: *See*—
von Schwerdtner, Otto; and Judith, Hans, 4,506,860, Cl. 251-124.000.

Jung, Albert, to Siemens Aktiengesellschaft. Electronic components and system carrier assembly. 4,507,710, Cl. 361-428.000.

Junghans, Klaus, to Schering Aktiengesellschaft. Process for the preparation of 3-(Δ^4-3-ketosteroid-17α-yl)propionic acid lactones. 4,507,238, Cl. 260-239.570.

Jungheinrich Unternehmensverwaltung KG, Firma: *See*—
Griesenbrock, Karl-Heinz; David, Bernd; and Petersen, Carsten, 4,506,764, Cl. 187-9.00E.

Junker, Ralph D.; and Helms, James R., to Junker Systems, Inc. Firing mechanism for automatic firearm. 4,506,589, Cl. 89-190.000.

Junker Systems, Inc.: *See*—
Junker, Ralph D.; and Helms, James R., 4,506,589, Cl. 89-190.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Tomisaka, Yasushi, 4,507,134, Cl. 62-30.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Igarashi, Michiaki; Inui, Takayasu; Otsuka, Kazuo; Nogami, Saburo; and Nishimura, Satoru, 4,507,057, Cl. 417-216.000.
Matsumoto, Takeshi; Yoshida, Shuji; and Shikimi, Katsuji, 4,506,757, Cl. 180-294.000.
Yamashita, Hisateru, 4,506,574, Cl. 83-217.000.

Kabushiki Kaisha Maruyama Seisakusho: *See*—
Shimizu, Yoichi, 4,506,707, Cl. 139-91.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Miyazaki, Kiyoshi, 4,507,590, Cl. 318-254.000.

Kabushiki Kaisha Sato: *See*—
Kondo, Kouichi; and Tamura, Tadashi, 4,507,666, Cl. 346-76.0PH.

Kabushiki Kaisha Sigma Electronics Planning: *See*—
Shimojo, Hirokazu; and Inamura, Toshio, 4,506,650, Cl. 123-620.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Yamaguchi, Terumoto; and Terajima, Tsuneo, 4,506,722, Cl. 164-130.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisa-Kusho: *See*—
Kobayashi, Hisao; Ohno, Makoto; and Suzuki, Shinichi, 4,507,059, Cl. 417-270.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Taga, Yasunori; and Sawada, Yutaka, 4,507,547, Cl. 219-543.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho and Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Yamada, Masatoshi; Yasuda, Eiichi; Kimura, Masanobu; Ueda, Tatehito; and Hashimoto, Eiji, 4,506,545, Cl. 73-119.00A.

Kadkade, Prakash G.; and Botticelli, Charles R., to GTE Laboratories Incorporated. Use of night-break lighting to increase fruit set in economically important fruit crops. 4,506,474, Cl. 47-58.000.

Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, to Teijin Limited. Perpendicular magnetic recording medium. 4,507,364, Cl. 428-457.000.

Kaduk, Bruce A.: *See*—
Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., 4,507,442, Cl. 525-439.000.

Kaempfer, Knut: *See*—
Broecker, Franz J.; Gettert, Hans; and Kaempfer, Knut, 4,507,274, Cl. 423-573.00R.

Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Pharmaceutical composition for treating transplanted tumor cells. 4,507,309, Cl. 514-379.000.

Kaiser, Carl: *See*—
DeMarinis, Robert M.; Hieble, J. Paul; Kaiser, Carl; and Wilson, James W., 4,507 320, Cl. 514-605.000.

Kajiwara, Makoto: *See*—
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,507,386, Cl. 430-549.000.

Kajiyama, Takashi: *See*—
Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, 4,507,179, Cl. 204-58.000.

Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kojima, Kazuhisa, to Mitsubishi Chemical Industries Limited. Process for preparing polyolefin. 4,507,450, Cl. 526-128.000.

Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, to Hitachi, Ltd.; and Toyo Ink Manufacturing Co., Ltd. Electrophotographic recording medium containing τ and η metal-free phthalocyanine. 4,507,374, Cl. 430-56.000.

Kalama Chemical, Inc.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,507,486, Cl. 546-345.000.

Kaldas, George A., to Texas Instruments Incorporated. Display system for data in different forms of writing, such as the arabic and latin alphabets. 4,507,734, Cl. 364-419.000.

Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; Oka, Masahisa; and Yamashita, Haruhiro, to Bristol-Myers Company. Chemical compounds. 4,507,487, Cl. 548-194.000.

Kambara, Koji; Misawa, Kazuo; Honda, Mikio; Matsui, Koichi; and Kohri, Kitijiro, to Olympus Optical Co., Ltd. Medical capsule device. 4,507,115, Cl. 604-135.000.

Kame, Yuichi: *See*—
Shimizu, Kunio; Kame, Yuichi; and Tsuji, Yoshimasa, 4,506,953, Cl. 350-276.00R.

Kameya, Kazuo, to Elmec Corporation. Delay line. 4,507,628, Cl. 333-138.000.

Kamins, Theodore I.; Bradbury, Donald R.; and Drowley, Clifford I., to Hewlett-Packard Co. Trench isolated transistors in semiconductor films. 4,507,158, Cl. 148-175.000.

Kamishiro, Toshiro: *See*—
Masaki, Tomoh; Kamishiro, Toshiro; Okazoe, Takashi; Kumakura, Koichi; and Masaki, Mitsuo, 4,507,297, Cl. 514-252.000.

Kamiyama, Masahide: *See*—
Sugita, Toshio; and Kamiyama, Masahide, 4,507,561, Cl. 250-484.100.

Kamiyama, Setsuo: *See*—
Okumura, Yoshiharu; Kamiyama, Setsuo; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,507,512, Cl. 568-897.000.

Kammerer, Gerd, to Dieter Graesslin Feinwerktechnik. Time-controlled heat regulator with nighttime temperature lowering capability. 4,506,826, Cl. 236-46.00R.
Kamp, Arthur J., to Dow Chemical Company, The. Analysis of salt concentrations. 4,506,543, Cl. 73-61.00R.
Kampf, Richard S., to Beckman Instruments, Inc. Sample handling apparatus. 4,506,777, Cl. 198-341.000.
Kanda, Mikio: *See*—
Nakamura, Yoshiharu; and Kanda, Mikio, 4,506,911, Cl. 280-801.000.
Kanda, Mutsumi; Inoue, Tokuta; Matsushita, Souichi; and Nakanishi, Kiyoshi, to Toyota Jidosha Kabushiki Kaisha. Piston assembly with cooling lubricant reservoir defining member engaged to piston pin mounting bosses. 4,506,632, Cl. 123-41.350.
Kanebo, Ltd.: *See*—
Okuyama, Genichiro; Takemoto, Shizume; and Otani, Yasuhisa, 4,507,279, Cl. 424-63.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, 4,507,514, Cl. 570-262.000.
Kato, Yasushi; and Furukawa, Hisao, 4,507,437, Cl. 525-106.000.
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, 4,507,469, Cl. 528-425.000.
Kaneko, Katsumi: *See*—
Okumura, Yoshiharu; Kamiyama, Setsuo; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,507,512, Cl. 568-897.000.
Kaneko, Kimiyoshi: *See*—
Ozaki, Yoshiharu; Kaneko, Kimiyoshi; and Mitachi, Senshu, 4,507,245, Cl. 260-429.200.
Kaneko, Masaharu: *See*—
Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.
Kanfer, Joseph S. Multiple-use container. 4,506,784, Cl. 206-77.100.
Kanno, Masashi: *See*—
Gohara, Yoshihiro; Kanno, Masashi; and Yamashita, Ichiro, 4,507,523, Cl. 178-19.000.
Kanno, Toyoji: *See*—
Sakurada, Kazuyuki; Funyu, Yutaka; Togashi, Fusao; Kanno, Toyoji; and Masuda, Toshikazu, 4,506,531, Cl. 72-8.000.
Kaplan, Robert A.: *See*—
Daly, Richard T.; Rhoades, Walter; Stone, Harvey; and Kaplan, Robert A., 4,507,789, Cl. 372-92.000.
Kapral, Christopher W., to GTE Communications Products Corporation. Charge redistribution A-law PCM decoder. 4,507,650, Cl. 340-347.0DA.
Karas, Bradley R.; and Baumgartner, Charles E., to General Electric Company. Bubble pressure barrier and electrode composite. 4,507,262, Cl. 419-2.000.
Karas, Richard J.: *See*—
Carbo, Adelaida L.; Good, Raymond H.; and Karas, Richard J., 4,507,339, Cl. 428-35.000.
Karasawa, Hisashi: *See*—
Shigenobu, Hiromichi; Nakabayashi, Takao; Akiyama, Kitio; Miida, Masao; and Karasawa, Hisashi, 4,506,596, Cl. 99-289.00T.
Karl Lautenschlager KG, Mobelbeschlagfabrik: *See*—
Lautenschlager, Gerhard W., 4,506,409, Cl. 16-238.000.
Karns, Albert L.; and Jennings, Robert M. Drip coffee making kit. 4,506,597, Cl. 99-295.000.
Kasai, Masaaki; Ichikawa, Toshiji; and Kosegaki, Kimiho, to Terumo Kabushiki Kaisha. Medical articles. 4,507,415, Cl. 524-101.000.
Kasei Optonix, Ltd.: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,507,563, Cl. 250-486.100.
Kassner, Reinhard; Mader, Karl-Heinz; and Cook, Lee M., to Schott Glass Technologies, Inc. Highly prefractive, low dispersion optical glass suitable for multifocal corrective lenses. 4,507,393, Cl. 501-75.000.
Kato, Hisatoyo, to Fuji Photo Film Co., Ltd. Data recording system using stimulable phosphor. 4,507,797, Cl. 378-165.000.
Kato, Kiichi, to Olympus Optical Co., Ltd. Optical information recording and/or reproducing apparatus and optical record medium for use in such apparatus. 4,507,763, Cl. 369-44.000.
Kato, Toshiro: *See*—
Yamada, Yoshimi; Ooishi, Tadashi; Kato, Toshiro; and Mukai, Kunio, 4,507,284, Cl. 514-140.000.
Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition. 4,507,437, Cl. 525-106.000.
Kato, Yoshinori; Umemoto, Naoji; Saito, Masahiko; and Hara, Takeshi, to Teijin Limited. Conjugate having cytotoxicity and process for the preparation thereof. 4,507,234, Cl. 260-121.000.
Katou, Takashi; and Itou, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Exhaust gas-purifying device of an internal combustion engine. 4,506,644, Cl. 123-439.000.
Katryniok, Detlef: *See*—
Ruch, Jean; Katryniok, Detlef; and Pack, Hugo, 4,507,367, Cl. 429-27.000.
Katscher, Werner: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.
Katunuma, Nobuhiko: *See*—
Tamai, Masaharu; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; Omura, Sadafumi; and Katunuma, Nobuhiko, 4,507,232, Cl. 260-112.50R.
Kaufmann, Herbert; and Larsson, Jan, to ASEA Aktiebolag. Welding robot. 4,507,534, Cl. 219-86.700.
Kausch, William L.: *See*—
Rousseau, Alan D.; Fohrenkamm, Elsie A.; and Kausch, William L., 4,507,382, Cl. 430-275.000.
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, to Dainippon Ink and Chemicals, Inc. Method for purifying polyphenylene sulfide. 4,507,468, Cl. 528-388.000.
Kawamoto, Kiyoaki: *See*—
Shukuri, Katsuhiro; Inowa, Shigeru; and Kawamoto, Kiyoaki, 4,506,975, Cl. 355-15.000.
Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; and Kawamura, Hideaki, 4,507,738, Cl. 364-474.000.
Kawamura, Naoto, to Canon Kabushiki Kaisha. Image recording device. 4,507,685, Cl. 358-283.000.
Kawasaki, Noboru: *See*—
Nakayama, Shigenobu; Noda, Eiichi; Noguchi, Yoshiaki; Yamamoto, Isamu; and Kawasaki, Noboru, 4,507,500, Cl. 564-340.000.
Kay, D. Alan R.; and Wilson, William G., to Union Oil Company of California. Desulfurization of fluid materials. 4,507,149, Cl. 75-58.000.
Kaye, Bruce J.: *See*—
Waggoner, Clinton A.; Dominique, Harry P.; Moonie, Gary A.; and Kaye, Bruce J., 4,506,960, Cl. 350-529.000.
Kazanjy, Robert P., to Western Design Corp. Ammunition handling system and method. 4,506,588, Cl. 89-34.000.
Kazmaier, Peter M.: *See*—
Horgan, Anthony M.; Kazmaier, Peter M.; and Burt, Richard A., 4,507,480, Cl. 546-94.000.
Kazumi, Maruyama; and Yoshiyuki, Uchida, to Fuji Electric Co., Ltd.; and Fuji Electric Corporate Research & Development Co., Ltd. Photoelectronic conversion device. 4,507,519, Cl. 136-258.000.
Keating, John E., to Westinghouse Electric Corp. Narrow beam radar installation for turbine monitoring. 4,507,658, Cl. 343-12.00R.
Keefer, Donald W.: *See*—
Fogel, Isaac; and Keefer, Donald W., 4,506,397, Cl. 5-451.000.
Kehl, Rainer, to Siemens Aktiengesellschaft. Assembly for the transmission of control signals to and/or from mobile equipment. 4,507,645, Cl. 340-310.00A.
Kelleher, Kevin C., to RCA Corporation. Linear pulse width to current converter for brushless DC motors. 4,507,591, Cl. 318-254.000.
Kelly, Michael L., to Analog & Digital Systems, Inc. Enclosed magnet loudspeaker. 4,507,800, Cl. 381-88.000.
Kelsey, Jeffrey R.: *See*—
Gordon, Kevin R.; Kelsey, Jeffrey R.; and Stannard, Ivan C., 4,507,411, Cl. 523-436.000.
Kemmner, Ulrich; and Kleppner, Stephan, to Robert Bosch GmbH. Gas-filled damping element for damping pressure pulsations. 4,507,063, Cl. 417-540.000.
Kengaku, Katsumi: *See*—
Higo, Tsutomu; Mizutani, Shoji; Sawada, Yasuhiro; and Kengaku, Katsumi, 4,507,265, Cl. 422-186.000.
Kent Corporation: *See*—
Hood, Walter J., 4,506,841, Cl. 242-55.000.
Keritsis, Gus D., to Philip Morris Incorporated. Modified cellulosic smoking material and method for its preparation. 4,506,684, Cl. 131-369.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.
Kerr Glass Manufacturing Corporation: *See*—
Herr, James E., 4,506,795, Cl. 215-252.000.
Kerrebrock, Jack L. Internal combustion engine. 4,506,634, Cl. 123-68.000.
Kerschgens, Johann J. Appliance for the treatment of hair and scalp. 4,506,454, Cl. 34-4.000.
Khan, Shuaib A.; and Haliburton, James, to Exxon Production Research Co. Process for LPG recovery. 4,507,133, Cl. 62-29.000.
Kharouf, Issa J.: *See*—
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 4,507,190, Cl. 204-206.000.
Kiejzik, Paul A. Microfilm inserter/viewer apparatus. 4,506,976, Cl. 355-45.000.
Kielbania, Andrew J., Jr., to Rohm and Haas Company. Polymers adherent to polyolefins. 4,507,342, Cl. 428-90.000.
Kiesel, George W.: *See*—
Morris, Robert A.; Kiesel, George W.; Rajotte, Paul T.; and Richards, Anthony L., 4,507,709, Cl. 361-400.000.
Kikuchi, Toru; Saito, Takayuki; Kobayashi, Akihiro; and Goto, Hitoshi, to Hitachi Chemical Co., Ltd. Epoxy resin composition. 4,507,460, Cl. 525-507.000.
Killer, Walter: *See*—
Riniker, Hans; and Killer, Walter, 4,506,838, Cl. 241-98.000.
Kilpela, Tauno B., to Michigan Technological University, Board of Control of. Flake aligner including reciprocating baffles. 4,506,778, Cl. 198-382.000.
Kim, Chang J., to Burke Marketing Services, Inc. Market research booklet. 4,506,913, Cl. 283-56.000.
Kim, Hyoung J. Collapsible golf bags and supports therefor. 4,506,854, Cl. 248-96.000.
Kim, Yong K.: *See*—
Sullivan, Jack M.; Kim, Yong K.; and Waerstad, Kjell R., 4,507,139, Cl. 71-50.000.

Kimura, Hiroshi: *See*—
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.

Kimura, Kazuaki: *See*—
Minami, Masana; Tamaki, Hiroshi; Sasaki, Tsuneo; and Kimura, Kazuaki, 4,507,647, Cl. 340-347.00P.

Kimura, Kenji, to Olympus Optical Co., Ltd. Television signal recording and reproducing apparatus. 4,507,686, Cl. 358-310.000.

Kimura, Masanobu: *See*—
Yamada, Masatoshi; Yasuda, Eiichi; Kimura, Masanobu; Ueda, Tatehito; and Hashimoto, Eiji, 4,506,545, Cl. 73-119.00A.

Kinberg, Benjamin. Toy eye construction. 4,507,099, Cl. 446-389.000.

Kinch, Michael A.: *See*—
Beck, Jeffrey D.; Schaake, Herbert F.; Tregilgas, John H.; and Kinch, Michael A., 4,507,160, Cl. 148-191.000.

King, Allen D., Jr.; King, R. Bruce; and Linn, Donald E., Jr., to University of Georgia Research Foundation, Inc. Photogeneration of active formate decomposition catalysts from transition metal complexes containing manganese and the production of hydrogen. 4,507,185, Cl. 204-157.10R.

King, Arthur S. Mechanism for recovering and collecting extracted polar liquids. 4,507,193, Cl. 204-302.000.

King Jim Co., Ltd.: *See*—
Ohminato, Kiyoshi; and Miyamoto, Kenzo, deceased, 4,506,416, Cl. 24-67.00R.

King, R. Bruce: *See*—
King, Allen D., Jr.; King, R. Bruce; and Linn, Donald E., Jr., 4,507,185, Cl. 204-157.10R.

Kingsbury, Charles M.; Beckwith, Bruce R.; and Messina, Anthony, to Emhart Industries, Inc. Delivery system for glassware forming machine. 4,507,138, Cl. 65-158.000.

Kinoshita, Kazuhisa: *See*—
Inoue, Takehisa; and Kinoshita, Kazuhisa, 4,506,767, Cl. 188-73.380.

Kinpara, Akiyoshi: *See*—
Kobayashi, Hidetaka; and Kinpara, Akiyoshi, 4,507,090, Cl. 440-52.000.

Kinze Manufacturing, Inc.: *See*—
Kinzenbaw, Jon E., 4,506,904, Cl. 280-415.00R.

Kinzenbaw, Jon E., to Kinze Manufacturing, Inc. Agricultural implement convertible between use and transport positions. 4,506,904, Cl. 280-415.00R.

Kircaldie, Randall and McNab: *See*—
Durkan, Gerald, 4,506,666, Cl. 128-204.230.

Kirchner, Hans-Gert: *See*—
Bernert, Claus-Rudiger; Kirchner, Hans-Gert; and Nader, Reinhard, 4,507,473, Cl. 536-86.000.

Kishi, Atsuo: *See*—
Hayase, Isao; Suginuma, Atsushi; and Kishi, Atsuo, 4,507,068, Cl. 418-150.000.

Kitajima, Tomoya; and Araki, Kunihiko, to Ricoh Company, Ltd. Motor-driven winding and rewinding camera. 4,506,965, Cl. 354-173.100.

Kitz, Steven L.: *See*—
Boone, Joe P.; Head, William J.; and Kitz, Steven L., 4,506,627, Cl. 118-708.000.

Klar, Gerhard. Machine for manufacturing bag-like two-compartment packages, particularly tea bags. 4,506,490, Cl. 53-134.000.

Klatt, Alfred, to WABCO Fahrzeugbremsen GmbH. Transmission gear shift control system. 4,507,736, Cl. 364-424.100.

Klawitter, Ronald R., to Handi-Pac, Inc. Toy assembly. 4,507,097, Cl. 446-236.000.

Klein, Horst, to Blendax-Werke R. Schneider GmbH & Co. Electrically operated toothbrush. 4,506,400, Cl. 15-22.00R.

Kleinherne, Herbert: *See*—
Hofmann, Heinz; Striepeke, Wilhelm; Werner, Manfred; Kleinherne, Herbert; and Zillessen, Christoph, 4,507,021, Cl. 405-288.000.

Kleinschmit, Peter: *See*—
Panster, Peter; Michel, Rudolf; Kleinschmit, Peter; and Deschler, Ulrich, 4,507,490, Cl. 556-427.000.

Kleppner, Stephan: *See*—
Kemmner, Ulrich; and Kleppner, Stephan, 4,507,063, Cl. 417-540.000.

Klett, Robert J.: *See*—
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,507,195, Cl. 208-11.00R.

Klijanowicz, James E.: *See*—
Gabrielsen, Rolf S.; Graham, Patricia A.; and Klijanowicz, James E., 4,507,479, Cl. 544-348.000.

Klioze, Solomon S., to Hoechst-Roussel Pharmaceuticals Inc. cis-4a-Aryl-1,2,3,4,4a,9b-hexahydro-benzofuro[3,2-c]pyridines and their anti-convulsant and analgesic activity. 4,507,306, Cl. 514-291.000.

Klockner-Humboldt-Wedag AG: *See*—
Herchenbach, Horst; Wolter, Albrecht; and Steinbiss, Eberhard, 4,507,153, Cl. 106-100.000.

Klowak, Bernard G.; and Salmeen, Nilo I., Jr., deceased (by Salmeen, Lorraine J., personal representative), to James River-Norwalk, Inc. Pattern bonding and creping of fibrous products. 4,507,173, Cl. 162-112.000.

Kluger, Edward W.; and Moore, Patrick D., to Milliken Research Corporation. Process for in situ coloration of thermosetting resins. 4,507,407, Cl. 521-113.000.

Kmetz, Allan R., to AT&T Bell Laboratories. Interconnection and addressing scheme for LCDs. 4,506,955, Cl. 350-336.000.

Knapp, Kenneth M. Bristle pig cup. 4,506,401, Cl. 15-104.06R.

Knight, Orien M.: *See*—
Davis, Albert P., Jr.; Knight, Orien M.; and Stoltz, John W., 4,506,729, Cl. 166-65.00M.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,506,862, Cl. 251-149.500.

Knop, Karl H., to RCA Corporation. Diffractive color separation filter. 4,506,949, Cl. 350-162.190.

Kobata, Fumihiro: *See*—
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,507,468, Cl. 528-388.000.

Kobayashi, Akihiro: *See*—
Kikuchi, Toru; Saito, Takayuki; Kobayashi, Akihiro; and Goto, Hitoshi, 4,507,460, Cl. 525-507.000.

Kobayashi, Hidetaka; and Kinpara, Akiyoshi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Propelling unit support structure for outboard engines. 4,507,090, Cl. 440-52.000.

Kobayashi, Hisao; Ohno, Makoto; and Suzuki, Shinichi, to Kabushiki Kaisha Toyoda Jidoshokki Seisa-Kusho. Variable delivery compressor. 4,507,059, Cl. 417-270.000.

Kobayashi, Kazuhiko: *See*—
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Susuki, Tosaku, 4,507,465, Cl. 528-312.000.

Kobayashi, Minoru, to Olympus Optical Co., Ltd. Tape recorder having transit noise preventing means. 4,507,695, Cl. 360-105.000.

Kobayashi, Mitsunori: *See*—
Doi, Yoshihiko; Maeda, Yoshiki; and Kobayashi, Mitsunori, 4,507,189, Cl. 204-192.00N.

Kocher, Erich J.; Szymaszek, Paul G.; and Nikolaus, John G., to Vilter Manufacturing Corporation. Rotary gas compressor having rolling pistons. 4,507,064, Cl. 418-15.000.

Kockums Cancar, Corp.: *See*—
Gaitten, Walden M., deceased, 4,506,713, Cl. 144-208.00E.

Kockums Industri AB: *See*—
Hedlund, Bo P. S.; and Arnoldsson, Erik, 4,506,792, Cl. 212-223.000.

Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble memory device. 4,507,755, Cl. 365-36.000.

Koenig, Alan R.; and Moon, Edward L., to Jim Walter Corporation. Apparatus and method for producing shot-free mineral wool. 4,507,197, Cl. 209-2.000.

Kogure, Osamu: *See*—
Morita, Masao; Tanaka, Akinobu; Imamura, Saburo; Tamamura, Toshiaki; and Kogure, Osamu, 4,507,384, Cl. 430-311.000.

Kohl, Albert; Schneider, Norbert; Ley, Gregor; Balz, Werner; Melzer, Milena; and Jakusch, Helmut, to BASF Aktiengesellschaft. Production of magnetic recording media. 4,507,457, Cl. 427-48.000.

Kohlensaeurewerk GmbH: *See*—
Kunz, Werner; and Broeckels, Theo, 4,507,542, Cl. 219-130.510.

Kohnen, Julius: *See*—
Kutz, Johannes; Itgenhorst, Dieter; and Kohnen, Julius, 4,506,526, Cl. 68-15.000.

Kohno, Michinaga: *See*—
Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, 4,507,046, Cl. 414-735.000.

Kohno, Takeshi: *See*—
Haruki, Kazuhito; Kohno, Takeshi; and Nagase, Yasuo, 4,507,739, Cl. 364-478.000.

Kohri, Kitijiro: *See*—
Kambara, Koji; Misawa, Kazuo; Honda, Mikio; Matsui, Koichi; and Kohri, Kitijiro, 4,507,115, Cl. 604-135.000.

Koike, Naomasa; and Hiraishi, Shigetoshi, to Mitsubishi Paper Mills, Ltd. Thermosensitive recording sheet. 4,507,671, Cl. 346-216.000.

Koike, Tatsuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Tone pattern identifying system. 4,506,580, Cl. 84-1.010.

Koizumi, Masuo: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Kojima, Kazuhisa: *See*—
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kojima, Kazuhisa, 4,507,450, Cl. 526-128.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Tatekura, Koichi; Yamamoto, Hitoshi; Nunokawa, Makoto; and Ejiri, Yoshihiro, 4,506,947, Cl. 350-96.210.

Koller, Josef: *See*—
Puntener, Alois; and Koller, Josef, 4,507,125, Cl. 8-437.000.

Komai, Takeshi: *See*—
Banno, Shigeki; and Komai, Takeshi, 4,507,432, Cl. 525-21.000.

Komatsu, Toshiyuki: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,507,375, Cl. 430-128.000.

Komori Printing Machinery Co., Ltd.: *See*—
Sugiyama, Hiroyuki; and Ishida, Masaaki, 4,506,602, Cl. 101-230.000.

Konaka, Yukio, to Shibuya Kogyo Co., Ltd. Method for mounting a faucet on a paper container and apparatus therefor. 4,507,168, Cl. 156-379.800.

Kondo, Kiichi: *See*—
Tsuruta, Hirobumi; and Kondo, Kiichi, 4,507,383, Cl. 430-275.000.

Kondo, Kouichi; and Tamura, Tadashi, to Kabushiki Kaisha Sato. Thermal head supporting mechanism. 4,507,666, Cl. 346-76.0PH.

Konig, Helmut, to Olympus Winter & Ibe GmbH. Insulated sleeve high frequency resectoscope. 4,506,668, Cl. 128-303.150.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kuge, Takao, 4,506,966, Cl. 354-195.100.
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,507,386, Cl. 430-549.000.
Shukuri, Katsuhiro; Inowa, Shigeru; and Kawamoto, Kiyoaki, 4,506,975, Cl. 355-15.000.
Tsuchino, Hisanori; Teshima, Manami; Takeuchi, Hiroshi; and Shimada, Fumio, 4,507,379, Cl. 430-139.000.
Wada, Tsuneo; Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; and Takagiwa, Hiroyuki, 4,507,378, Cl. 430-137.000.
Kordosky, Gary A.; Mackay, Kenneth D.; Sudderth, R. Brantley; and Sierakoski, Joseph M., to Henkel Corporation. Solvent extraction. 4,507,268, Cl. 423-24.000.
Kornfeld, Edmund C.: *See*—
Nichols, Cynthia L.; Kornfeld, Edmund C.; and Schaus, John M., 4,507,478, Cl. 544-250.000.
Korosue, Akira. Lever-operated type of wheelchair. 4,506,900, Cl. 280-242.0WC.
Kosegaki, Kimiho: *See*—
Kasai, Masaaki; Ichikawa, Toshiji; and Kosegaki, Kimiho, 4,507,415, Cl. 524-101.000.
Koseki, Yoshihiro: *See*—
Sakamoto, Hiroshi; Koseki, Yoshihiro; Motosugi, Takanori; and Inaba, Norihiko, 4,507,669, Cl. 346-207.000.
Koshio, Yoshihiro: *See*—
Ito, Yukio; and Koshio, Yoshihiro, 4,506,882, Cl. 271-303.000.
Kosugi, Masao: *See*—
Sato, Hiroshi; Yabu, Shuichi; and Kosugi, Masao, 4,506,977, Cl. 355-53.000.
Kovacic, Guido: *See*—
Luhrig, Hermann; and Kovacic, Guido, 4,506,843, Cl. 242-74.000.
Kozuki, Susumu; Takimoto, Hiroyuki; and Maeda, Masaya, to Canon Kabushiki Kaisha. Component video system and arrangement for interconnecting the same. 4,507,689, Cl. 360-33.100.
Kraftwork Union AG: *See*—
von Schwerdtner, Otto; and Judith, Hans, 4,506,860, Cl. 251-124.000.
Kramer, Kenneth D., to Deere & Company. Poppet valve with float function. 4,506,700, Cl. 137-596.160.
Krappel, Alfred; Guggenmos, Johannes; and Holzmann, Josef, to Bayerische Motoren Werke A.G. Ignition system for internal combustion engines. 4,506,643, Cl. 123-418.000.
Krause, Werner: *See*—
Pieper, Werner; and Krause, Werner, 4,507,249, Cl. 260-502.40R.
Kretschmer, Frank F., Jr.: *See*—
Lewis, Bernard L.; and Kretschmer, Frank F., Jr., 4,507,659, Cl. 343-17.2PC.
Krieger, Klaus E., to Zinser Textilmaschinen GmbH. Yarn-drafting apparatus. 4,506,414, Cl. 19-240.000.
Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Apparatus for facilitating a longitudinal adjustment of ski-binding parts. 4,506,905, Cl. 280-633.000.
Krogh, Egon; and Blohm, Knud, to Danfoss A/S. Method and apparatus for operating clutch and brake control device of machines having intermittent, undirectional operation. 4,506,771, Cl. 192-12.00R.
Kronogard, Sven-Olof, deceased; and by Linden, Allan, administrator, to United Turbine AB & Co., KG. Gas turbine plant. 4,506,509, Cl. 60-720.000.
Kropp, Philip: *See*—
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,507,300 Cl. 514-280.000.
Krsek, George, to Progenics, Inc. Manufacture of androstandione. 4,507,242, Cl. 260-397.300.
Krug, Robert W.: *See*—
Alvarez, Joseph A., III; Brennen, John F.; Krug, Robert W.; Gobioff, Bruce D.; and Shabe, John, 4,507,781, Cl. 370-104.000.
Kucharska, Helena Z.; and Burton, Thomas M., to Fiberglas Canada Inc. Blowing agents and their use in preparations of polyester foams. 4,507,406, Cl. 521-85.000.
Kudo, Yozo: *See*—
Sawa, Yuji; and Kudo, Yozo, 4,507,039, Cl. 414-152.000.
Kuechler, Irvin R. Compact double fan apparatus and method with grease-separating capabilities. 4,506,655, Cl. 126-299.00D.
Kuehne, Norbert: *See*—
Raehse, Wilfried; Kuehne, Norbert; Wuest, Willi; and Engelskirchen, Konrad, 4,507,474, Cl. 536-97.000.
Kuge, Takao, to Konishiroku Photo Industry Co., Ltd. Shutter release device for autofocusing camera. 4,506,966, Cl. 354-195.100.
Kuhl, Adolf, to Orell Fussli Graphische betriebe AG. Planar card made of a thermoplastic material having visually recognizable safety markings and method of manufacturing such card. 4,506,916, Cl. 283-91.000.
Kuhle, Engelbert: *See*—
Heywang, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; Hammann, Ingeborg; and Homeyer, Bernhard, 4,507,292, Cl. 514-183.000.
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, to Friefrich Munch GmbH & Co. KG. Metal ring fabric for protective clothing. 4,507,353, Cl. 428-222.000.
Kuhne, Friedrich-Wilhelm. Stabilized activated oxygen and pharmaceutical compositions containing said stabilized activated oxygen. 4,507,285, Cl. 424-130.000.
Kukes, Simon G. Catalyst for demetallization of hydrocarbon containing feed streams. 4,507,402, Cl. 502-208.000.
Kumakura, Koichi: *See*—
Masaki, Tomoh; Kamishiro, Toshiro; Okazoe, Takashi; Kumakura, Koichi; and Masaki, Mitsuo, 4,507,297, Cl. 514-252.000.
Kumano, Isao: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.
Kumar, Binod: *See*—
Daly, Richard T.; Cohen, Martin G.; and Kumar, Binod, 4,507,787, Cl. 372-62.000.
Kung, Susan W.: *See*—
Tam, Johann; Ashjaee, Jalal; Kuwaki, Nobuo B.; Ngo, Tuan M.; and Kung, Susan W., 4,507,078, Cl. 432-11.000.
Kunimasa, Koichi; Futamura, Setsuo; and Okada, Jun, to Hitachi, Ltd. Method and apparatus of packet switching. 4,507,782, Cl. 371-32.000.
Kunkel, Kenneth E.: *See*—
Bruce, Charles W.; Kunkel, Kenneth E.; and Webb, Fred C., 4,506,553, Cl. 73-861.650.
Kunz, Werner; and Broeckels, Theo, to Kohlensaeurewerk GmbH. Impulse welding device for gas shielded arc welding. 4,507,542, Cl. 219-130.510.
Kunze, Wolfgang; and Schweckendieck, Bernd, to Bodenseewerk Perkin-Elmer & Co., GmbH. Apparatus for use in thermomechanical analysis. 4,506,547, Cl. 73-150.00R.
Kupper, Wilhelm, to W. Schlafhorst & Co. Warp beam winding frame. 4,506,420, Cl. 28-190.000.
Kupper, Wilhelm, to W. Schlafhorst & Co. Bobbin separating unit. 4,506,572, Cl. 83-112.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sawa, Yuji; and Kudo, Yozo, 4,507,039, Cl. 414-152.000.
Kuriyama, Shizuo; and Saitoh, Mikio, to Eisai Co., Ltd.; and Mitsubishi Chemical Industries Limited. Pharmaceutical composition useful for improvement and/or treatment of mental symptoms caused by organic disorder in brain. 4,507,322, Cl. 514-648.000.
Kuroda, Akira: *See*—
Shimada, Shigeru; Kuroda, Akira; Tomiuga, Junichi; and Ishikawa, Shinzi, 4,507,430, Cl. 524-839.000.
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, to Nippon Oil Co., Ltd. Process for the production of polyolefins. 4,507,448, Cl. 526-125.000.
Kushida, Hachiro: *See*—
Murata, Toshio; Kushida, Hachiro; and Irie, Kenji, 4,507,184, Cl. 204-129.350.
Kusters, Eduard: *See*—
Appenzeller, Valentin; and Kusters, Eduard, 4,506,421, Cl. 29-116.0AD.
Kutz, Johannes; Itgenhorst, Dieter; and Kohnen, Julius, 4,506,526, Cl. 68-15.000.
Kutrieb, Wolfgang A. Tire pyrolizing. 4,507,174, Cl. 202-97.000.
Kutz, Johannes; Itgenhorst, Dieter; and Kohnen, Julius, to Kusters, Eduard. Apparatus for treating webs of material. 4,506,526, Cl. 68-15.000.
Kuwaki, Nobuo B.: *See*—
Tam, Johann; Ashjaee, Jalal; Kuwaki, Nobuo B.; Ngo, Tuan M.; and Kung, Susan W., 4,507,078, Cl. 432-11.000.
Kuypers, Harold A., to Scovill Inc. Plastic tire valve. 4,506,695, Cl. 137-223.000.
Kuzumoto, Masaki: *See*—
Yagi, Shigenori; Ogawa, Shuji; Kuzumoto, Masaki; and Tabata, Norikazu, 4,507,537, Cl. 219-121.0LA.
Kwan, Stephen C., to Texas Instruments Incorporated. Nth Order function converter. 4,507,577, Cl. 307-494.000.
Kyle, James C. Terminal assembly. 4,507,522, Cl. 174-152.0GM.
La Soudure Autogene Francaise: *See*—
Bernou, Joseph; and Sguazzi, Georges, 4,506,821, Cl. 228-5.700.
Labatt Brewing Company Limited: *See*—
Geiger, Kenneth H., 4,507,325, Cl. 426-16.000.
Laboratoires Fournier S.A.: *See*—
Gourbault, Maurice J., 4,507,231, Cl. 260-112.50R.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Delacour, Pierre; and Prost, Roger, 4,506,512, Cl. 62-49.000.
Lamar, Roger H.; and Davis, Robert A., to Bahnson Company, The. Controlling energy in an air-conditioning system. 4,506,514, Cl. 62-91.000.
Lamb, Don Q., Sr. Basketball practice apparatus. 4,506,886, Cl. 273-1.50A.
Lamb, Joseph T., to Parks-Cramer Company. Textile yarn spinning machine with supply strand interruption. 4,506,498, Cl. 57-87.000.
Lamb, Steve R.: *See*—
Andrews, E. Trent; Lamb, Steve R.; and Moore, Robert R., 4,506,665, Cl. 128-202.270.
Lambelin, Georges E.: *See*—
Niebes, Paul J.; Matagne, Daniel M.; Hanon, Etienne P.; Roba, Joseph L.; and Lambelin, Georges E., 4,507,314, Cl. 514-456.000.
Lambert, Jean-Pierre, to Etablissements Poirier. Wheel-chair adapted to enable the patient to stand up. 4,506,930, Cl. 297-423.000.
Lambert, Willibrordus J. S., to Honeywell Inc. Indicating device for defibrillators. 4,506,677, Cl. 128-697.000.
LaMonte, Salvatore. Attachment tool for a vacuum cleaner hose. 4,506,406, Cl. 15-398.000.
Landis, John M.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,506,940, Cl. 339-17.0LC.

Landry, Vincent: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 4,506,846, Cl. 242-199.000.

Lang-Ree, Nils: *See*—
Baker, Edward D.; Lang-Ree, Nils; and Johnson, Ralph K., 4,506,652, Cl. 126-21.00A.

Lange, Edward: *See*—
Wojciechowski, Jerzy; Haber, Jerzy; Gozdziewicz, Zygmunt; and Lange, Edward, 4,506,599, Cl. 99-469.000.

Langel, Rolf: *See*—
Thoma, Wilhelm; Langel, Rolf; Schmitz, Anton; and Schroer, Walter, 4,507,413, Cl. 524-42.000.

Langseth, Bryan: *See*—
Murrill, William D.; and Langseth, Bryan, 4,506,480, Cl. 52-121.000.

Larsen, Robert H.; and Odermann, Charles R., to Singer Company, The. Anti-jam thrust washer for sewing machine looptaker. 4,506,614, Cl. 112-228.000.

Larson, Robin R.: *See*—
McCracken, David R.; and Larson, Robin R., 4,507,576, Cl. 307-475.000.

Larsson, Jan: *See*—
Kaufmann, Herbert; and Larsson, Jan, 4,507,534, Cl. 219-86.700.

LASAG AG: *See*—
Roussel, Philippe, 4,506,962, Cl. 351-160.00R.

LaSarge, Eugene A.; Schermers, Franciscus; and Sugarbaker, Daniel L., to Lear Siegler, Inc. Heading reference and land navigation system. 4,507,737, Cl. 364-453.000.

Laser Technology, Inc.: *See*—
Newman, John W., 4,506,945, Cl. 350-3.600.

Lass, Joseph S.: *See*—
Maurer, Thomas; Holbein, Hans-Jurgen; and Lass, Joseph S., 4,507,346, Cl. 428-158.000.

Lautenschlager, Gerhard W., to Karl Lautenschlager KG, Mobelbeschlagfabrik. Single-pivot cabinet hinge. 4,506,409, Cl. 16-238.000.

Lautenschlager, Hans-Heiner; Hilboll, Gerd; Friehe, Hugo; and Lohr, Josef P., to A. Nattermann & Cie GmbH. 6-{4-(ω-(1-imidazolyl)-alkyl-phenyl}-3-oxo-2,3,4,5-tetrahydro-pyridazines and acid addition salts thereof, and a process for the treatment of inflammatory, atherosclerotic and thromboembolic illnesses in humans. 4,507,298, Cl. 514-247.000.

Lautenschlager, Heinz: *See*—
Geis, Heinz; Lautenschlager, Heinz; Schulte, Harmut; and Uliczka, Siegmund, 4,507,102, Cl. 474-101.000.

Laux, Keith R.; and Getgey, William F., to Idea Development Company, Inc. Aerial toy. 4,506,894, Cl. 273-425.000.

Lauzon, Rodrigue V., to Venture Innovations, Inc. Method of determining the optimum aqueous composition for preventing the swelling and dispersion of subterranean formation particles. 4,507,210, Cl. 252-8.50A.

Lavanish, Jerome M., to PPG Industries, Inc. Herbicidal 3-[substituted 3- or 5-isoxazolyl]-1-4-, or 5-substituted-2-imidazolidinones. 4,507,145, Cl. 71-092.000.

Lavelle, Joseph A.: *See*—
Hutton, Thomas W.; and Lavelle, Joseph A., 4,507,454, Cl. 526-317.000.

Lawrence, Thomas H.: *See*—
Jeffery, Philip A. E.; and Lawrence, Thomas H., 4,507,050, Cl. 416-90.00A.

Lawson, Duane C. Vector inversion generator. 4,507,567, Cl. 307-106.000.

Le Materiel Telephonique Thomson-CSF: *See*—
Houdard, Jean-Pierre; and Patte, Philippe F., 4,507,747, Cl. 364-724.000.

Leandersson, Enar: *See*—
Westerberg, Hans; and Leandersson, Enar, 4,506,872, Cl. 269-322.000.

Lear Siegler, Inc.: *See*—
LaSarge, Eugene A.; Schermers, Franciscus; and Sugarbaker, Daniel L., 4,507,737, Cl. 364-453.000.

Leatherman, Boyce: *See*—
Leatherman, Ralph W.; and Leatherman, Boyce, 4,507,566, Cl. 290-38.00R.

Leatherman, Ralph W.; and Leatherman, Boyce. Starter assembly for gasoline engines. 4,507,566, Cl. 290-38.00R.

LeBron, Melanie C.; and LeBron, Renard L. Newspaper vending machine. 4,506,775, Cl. 194-26.000.

LeBron, Renard L.: *See*—
LeBron, Melanie C.; and LeBron, Renard L., 4,506,775, Cl. 194-26.000.

Lee, John Y.; and Frey, Frederick W., to Ethyl Corporation. Process for preparing tertiary phosphines. 4,507,504, Cl. 568-17.000.

Lee, John Y.: *See*—
Frey, Frederick W.; and Lee, John Y., 4,507,503, Cl. 568-17.000.

Lee, Man S.; and Chang, Chieh, to GTE Communications Systems Corporation. Switched capacitor AM modulator/demodulator. 4,507,625, Cl. 332-31.00R.

Lee, Man S.: *See*—
Chang, Chieh; and Lee, Man S., 4,507,626, Cl. 332-31.00R.

Leggett & Platt, Incorporated: *See*—
Crum, Michael A., 4,506,925, Cl. 297-69.000.

LeGlue, Michael J., to McDermott Incorporated. Jacking apparatus having a fast repositioning stroke. 4,506,867, Cl. 254-108.000.

Le Goff, Pierre Y. J., to Centre National de la Recherche Scientifique C.N.R.S. Fractional distillation process and applications thereof to the production of thermal or mechanical energy from two low level heat sources. 4,507,175, Cl. 203-27.000.

Lehrkind, Nancy N.: *See*—
Northup, John D., 4,507,136, Cl. 65-79.000.

Lehtinen, Jukka, to Oy Tampella AB. Method for drying a porous web in an extended nip press. 4,506,456, Cl. 34-12.000.

Lehtinen, Jukka, to OY Tampella AB. Method and apparatus for drying a paper, or similar, web. 4,506,457, Cl. 34-41.000.

Leibinsohn, Saul. Apparatus for the induced infusion of a liquid from a flexible liquid bag. 4,507,116, Cl. 604-142.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Apparatus for regulating fiber quantities supplied to a textile machine. 4,506,413, Cl. 19-105.000.

LeMahieu, Ronald A.: *See*—
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., 4,507,498, Cl. 562-463.000.

Lemanczyk, Richard: *See*—
Daccord, Gerard; Lemanczyk, Richard; and Vercaemer, Claude, 4,507,213, Cl. 252-8.55R.

Lemont, Harold E., to Textron, Inc. Helicopter rotor thrust ring. 4,506,849, Cl. 244-17.210.

Lenkeit Industries, Inc.: *See*—
Alzmann, Donald R.; Angelo, Michael; and Waldner, Paul R., 4,506,442, Cl. 29-830.000.

Lenney, William E., to Air Products and Chemicals, Inc. Pressure sensitive adhesives with improved shear resistance. 4,507,429, Cl. 524-800.000.

Lentz, Carl M.; Overton, James R.; and Cornell, David D., to Eastman Kodak Company. Carbonylation process for the production of aromatic acids and derivatives thereof. 4,507,493, Cl. 560-103.000.

Lequeux, Michel L., to Minigrip-Belgium. Bag-collecting device. 4,507,038, Cl. 414-27.000.

Lesgourgues, Jacques; and Tirole, Jacques P. H., to S.N.E.C.M.A. Gas turbine blade with chamber for circulation of cooling fluid and process for its manufacture. 4,507,051, Cl. 416-97.00R.

Leskovec, Edward V., to Towmotor Corporation. Pivotal hood arrangement. 4,506,750, Cl. 180-69.210.

Lester, Roger, to USM Corporation. Shoe stiffeners. 4,507,357, Cl. 428-278.000.

Lester, Timothy E.: *See*—
Duckworth, Roger; Johnson, Roy A.; and Lester, Timothy E., 4,507,177, Cl. 204-1.00R.

Leung, Martin C. Disposable diaper with isolated wetness indicator. 4,507,121, Cl. 604-361.000.

Lever Brothers Company: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Levesque, Yvon, to Johnson & Johnson. Low density peat moss board. 4,507,122, Cl. 604-375.000.

Lew, Wing G.; Deutsch, Richard A.; and Nasserian, Mojtaba, to Adjustable Bushing Corporation. Expandable bushing and lock fastener. 4,507,034, Cl. 411-21.000.

Lewis, Bernard L.; and Kretschmer, Frank F., Jr., to United States of America, Navy. Pulse compression sidelobe suppressor. 4,507,659, Cl. 343-17.2PC.

Lewis, John J. Protective device. 4,506,889, Cl. 273-84.00R.

Ley, Anthony J.; and Bazin, Alain, to Enertec. Voltage-to-frequency converters. 4,507,624, Cl. 332-11.00D.

Ley, Gregor: *See*—
Kohl, Albert; Schneider, Norbert; Ley, Gregor; Balz, Werner; Melzer, Milena; and Jakusch, Helmut, 4,507,457, Cl. 427-48.000.

Liber, David C.: *See*—
Zeitler, Louie; and Liber, David C., 4,507,020, Cl. 405-259.000.

Libit, Sidney M. Collapsible luggage carrier. 4,506,897, Cl. 280-40.000.

Lichtenstein, Joseph: *See*—
Gordon, Marvin; and Lichtenstein, Joseph, 4,507,111, Cl. 604-3.000.

Lillibridge, Harold R., to Champion International Corporation. Method and apparatus for RF drying of coated articles. 4,506,452, Cl. 34-1.000.

Lin, Kun-Shan: *See*—
Frantz, Gene A.; and Lin, Kun-Shan, 4,507,750, Cl. 364-900.000.

Lin, Samuel O. S.: *See*—
Jacobine, Anthony F.; and Lin, Samuel O. S., 4,507,187, Cl. 204-159.130.

Lin, Weng-Pin. Modular toy whirling unit. 4,507,095, Cl. 446-118.000.

Lincoln, Clark N.; and Benzing, Norman L., to North American Outdoors, Inc. Animal liquid lure dispenser. 4,506,806, Cl. 222-175.000.

Lindberg, Frank A., to Westinghouse Electric Corp. RF module with integral coaxial connector means. 4,507,708, Cl. 361-392.000.

Linden, Allan, administrator: *See*—
Kronogard, Sven-Olof, deceased; and Linden, Allan, administrator, 4,506,509, Cl. 60-720.000.

Lindgren, Erik A. Double isolated shielding enclosure. 4,507,520, Cl. 174-35.0MS.

Linehan, Joseph J.; and Amato, Phillip S., to Samson Ocean Systems, Inc. Hawser line flotation. 4,506,622, Cl. 114-230.000.

Linn, Donald E., Jr.: *See*—
King, Allen D., Jr.; King, R. Bruce; and Linn, Donald E., Jr., 4,507,185, Cl. 204-157.10R.

Lion Corporation: *See*—
Tano, Tetsuo; and Hayashi, Akira, 4,507,223, Cl. 252-353.000.

Lipid Specialties, Inc.: *See*—
Sears, Barry D., 4,507,217, Cl. 252-62.540.

Liptay-Wagner, Nicholas: *See—*
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,506,980, Cl. 356-237.000.

Liqui-Box Corporation: *See—*
Schieser, Warren J.; Vickers, Stanley E.; and Duffey, Craig L., 4,506,489, Cl. 53-64.000.

Lisi, John E.: *See—*
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,507,137, Cl. 65-109.000.

Litton Systems, Inc.: *See—*
Wincent, Karl T., 4,507,003, Cl. 400-636.000.

Lloyd, Kenneth O.: *See—*
Pukel, Clifford S.; Lloyd, Kenneth O.; Travassos, Luiz R.; Dippold, Wolfgang G.; Oettgen, Herbert F.; and Old, Lloyd J., 4,507,391, Cl. 436-504.000.

Lob, James P., to Deere & Company. Center distance measuring tool. 4,506,447, Cl. 33-181.00R.

Lobo, Brian J., to Stauffer Chemical Company. Process for the formation of dialkyl phosphorochloridothionates. 4,507,252, Cl. 260-986.000.

Lock, Michele R.: *See—*
Falardeau, Edward R.; Frisch, Kurt C., Jr.; and Lock, Michele R., 4,507,410, Cl. 523-211.000.

Lockery, Harry E., to Hottinger Baldwin Measurements, Inc. Gaged plate transducer weighing apparatus. 4,506,746, Cl. 177-211.000.

Lockheed Corporation: *See—*
Rogers, Philip L., 4,506,979, Cl. 356-28.500.

Loctite Corporation: *See—*
Jacobine, Anthony F.; and Lin, Samuel O. S., 4,507,187, Cl. 204-159.130.

Loenissen, Karl-Josef: *See—*
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.

Loev, Bernard: *See—*
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,507,300, Cl. 514-280.000.

Logic Devices, Inc.: *See—*
Allen, Paul E., 4,507,056, Cl. 417-54.000.

Lohr, Josef P.: *See—*
Lautenschlager, Hans-Heiner; Hilboll, Gerd; Friehe, Hugo; and Lohr, Josef P., 4,507,298, Cl. 514-247.000.

Loitiere, Alain: *See—*
Buisson, Jacques; and Loitiere, Alain, 4,507,620, Cl. 330-307.000.

Lombardo, Anthony. Convertible table, chair, and bed combination. 4,506,927, Cl. 297-118.000.

Long, Arvin R., Jr. Apparatus for cleaning a dipstick. 4,506,402, Cl. 15-210.00B.

Lopez, Eugene F.: *See—*
Rinde, James A.; Lopez, Eugene F.; and Glover, Leon C., 4,507,340, Cl. 428-36.000.

Lord, Richard G., to Carrier Corporation. Refrigeration unit compressor control. 4,506,516, Cl. 62-117.000.

L'Oreal: *See—*
Goncalves, Antonin, 4,506,810, Cl. 222-391.000.
Goncalves, Antonin L., 4,506,808, Cl. 222-182.000.

Lotspeich, Joseph A., to Gross-Given Manufacturing Company. Shelf configuration for vending machines. 4,506,802, Cl. 221-75.000.

Louet, Daniel; and Darnois, Gilbert, to Thomson-CSF. Device comprising a cavity and a linear resonator fixed within said cavity, and a method of assembly of said device. 4,507,631, Cl. 333-222.000.

Loveless, Anthony H.: *See—*
Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., 4,507,315, Cl. 514-396.000.

Lovey, Raymond G.: *See—*
Bristol, James A.; and Lovey, Raymond G., 4,507,294, Cl. 514-249.000.

Low, Howard M.: *See—*
Steklenski, David J.; Upson, Donald A.; and Low, Howard M., 4,507,385, Cl. 430-523.000.

Lower, Loren D.; Marzocchi, Alfred; Ponn, Frederick H., III; and Roberts, Michael G., to Owens-Corning Fiberglas Corporation. Chemically modified asphalt protective coating solution and concrete coated with same. 4,507,365, Cl. 428-489.000.

Lowry, Michael R.: *See—*
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Lucas Industries public limited company: *See—*
Innocent, David B., 4,506,768, Cl. 188-370.000.

Lucht Engineering, Inc.: *See—*
Bartz, Stephen A., 4,506,824, Cl. 234-28.000.

Luhrig, Hermann; and Kovacic, Guido, to Agfa-Gevaert Aktiengesellschaft. Double-hooked spool. 4,506,843, Cl. 242-74.000.

Luk Lamellen und Kupplungsbau GmbH: *See—*
Schmid, Christoph, 4,506,770, Cl. 192-0.080.

Lund, Wesley C., to Boeing Aerospace Company. Depth control assembly. 4,507,026, Cl. 408-72.00B.

Lupton, Donald B. Laminate. 4,507,347, Cl. 428-166.000.

Lurssen, Klaus: *See—*
Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,507,141, Cl. 71-76.000.

Lyon, Richard K.: *See—*
Dean, Anthony M.; DeGregoria, Anthony J.; Hardy, James E.; Hurst, Boyd E.; and Lyon, Richard K., 4,507,269, Cl. 423-235.000.

M Group Corporation: *See—*
Fukase, Yutaka, 4,506,742, Cl. 173-4.000.

MacGregor, David C.; and Margules, Gary S., to Cordis Corporation. Breakable vial. 4,506,793, Cl. 215-32.000.

Machinefabriek Markert B.V.: *See—*
Markert, Heinrich W., 4,506,410, Cl. 17-11.000.

Machmerth, Herbert, to Ernst Leitz Wetzlar GmbH. Photographic camera and interchangeable lens for use therewith. 4,506,968, Cl. 354-286.000.

Mackay, Kenneth D.: *See—*
Kordosky, Gary A.; Mackay, Kenneth D.; Sudderth, R. Brantley; and Sierakoski, Joseph M., 4,507,268, Cl. 423-24.000.

Mackinnon, John W. M.: *See—*
Hayes, Roger; Bays, David E.; Mackinnon, John W. M.; and Carey, Linda, 4,507,296, Cl. 514-212.000.

Madden, James J., to AT&T Bell Laboratories. Integrated circuit chip carrier mounting arrangement. 4,506,938, Cl. 339-17.0CF.

Mader, Karl-Heinz: *See—*
Kassner, Reinhard; Mader, Karl-Heinz; and Cook, Lee M., 4,507,393, Cl. 501-75.000.

Madewell, George R., to Combustion Engineering, Inc. Apparatus for nondestructively measuring the thickness of a magnetic flux conductive clad material over a magnetic flux conductive base material of a different permeability. 4,507,609, Cl. 324-230.000.

Maebe, Richard M. Bicycle with steerable wheels. 4,506,902, Cl. 280-266.000.

Maeda, Masaya: *See—*
Kozuki, Susumu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,507,689, Cl. 360-33.100.

Maeda, Shigeo: *See—*
Niimura, Isao; Maeda, Shigeo; and Okazaki, Hideo, 4,507,237, Cl. 260-157.000.

Maeda, Yoshiki: *See—*
Doi, Yoshihiko; Maeda, Yoshiki; and Kobayashi, Mitsunori, 4,507,189, Cl. 204-192.00N.

Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, to Kasei Optonix, Ltd. Radiographic image conversion screens. 4,507,563, Cl. 250-486.100.

Magar, Surendar S., to Texas Instruments Incorporated. Microcomputer with ROM test mode of operation. 4,507,727, Cl. 364-200.000.

Magoon, Richard E. Segmented, floating fireproof oil-spill containment boom. 4,507,017, Cl. 405-66.000.

Mahabadi, John K.; and Ehrlich, Victor D., to Motorola, Inc. Resettable one shot circuit having noise rejection. 4,507,570, Cl. 307-273.000.

Maisons Phenix: *See—*
Tardif, Jean, 4,507,009, Cl. 403-306.000.

Makhlouf, Samir B. Maximum capability wrench. 4,506,567, Cl. 81-57.300.

Maki, Nagatoshi. Shotgun cartridge and wad thereof. 4,506,605, Cl. 102-457.000.

Makita, Muneharu; Oseto, Osamu; and Munemitsu, Toshiaki, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Electrophotographic toner composition. 4,507,376, Cl. 430-109.000.

Malaspina, Alex: *See—*
Paisley, Gary V.; and Malaspina, Alex, 4,507,405, Cl. 521-84.000.

Mallet, Bernard, to Nadella. Yoke in particular for a universal joint. 4,507,007, Cl. 403-157.000.

Malone, Frank L.: *See—*
Gupta, Alankar; Jenny, Robert W.; and Malone, Frank L., 4,506,851, Cl. 244-129.100.

Mangelschots, Benedikt: *See—*
Van Deyck, Frans; Weiss, Franz-Josef; Verberckt, Roger; Thomas, Erwin; Mangelschots, Benedikt; and Pijl, Paul, 4,507,271, Cl. 423-387.000.

Mann, Alfred E. Endocardial electrode. 4,506,679, Cl. 128-785.000.

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Schmidt, Hubertus; and Mucheyer, Norbert, 4,506,859, Cl. 251-63.000.

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Brown, Alvin E.; and Henneuse, Donald P., 4,506,552, Cl. 73-861.280.

Mannino, Mickeal: *See—*
Baker, Charles L.; and Mannino, Mickeal, 4,506,760, Cl. 182-5.000.

Marchant, Alan B., to Eastman Kodak Company. Optical disc and disc-turntable air flow interface assembly. 4,507,774, Cl. 369-271.000.

Marchant, George W., to APV International Limited. Flow control valve. 4,506,697, Cl. 137-312.000.

Marchetti, Augusto. Device for the control of the mutual removal and approching movement of lateral conveying units in a carton sealing and/or closing machine. 4,507,108, Cl. 493-167.000.

Marcon, Christian, to Valve Precision S.A.R.L. Dispenser device for liquids. 4,506,805, Cl. 222-153.000.

Margules, Gary S.: *See—*
MacGregor, David C.; and Margules, Gary S., 4,506,793, Cl. 215-32.000.

Marinak, Michael J.; and Simonson, John L., to Kalama Chemical, Inc. Production of polychlorinated pyridine mixtures by liquid phase chlorination of 3,5-lutidine or 3,5-lutidine hydrochloride. 4,507,786, Cl. 546-345.000.

Marion, Samuel, to Gerber Products Company. Baby chair. 4,506,928, Cl. 297-174.000.

Markert, Heinrich W., to Machinefabriek Markert B.V. Apparatus for the introduction of giblets into the body cavities of poultry. 4,506,410, Cl. 17-11.000.

Markuntovich, Felix D.: *See*—
Bragin, Boris F.; Gladky, Petr V.; Markuntovich, Felix D.; Pereletchikov, Evgeny F.; Frumin, Isidor I.; and Ekber, Boris Y., 4,506,865, Cl. 251-366.000.

Marr, Leonard D. Bulk material storage and mixing apparatus. 4,506,983, Cl. 366-44.000.

Marsh, Glenn A., to Union Oil Company of California. Liquid sensor and the use thereof in controlling the corrosion of pipelines. 4,506,540, Cl. 73-29.000.

Martenas, Wayne B.: *See*—
Fagnani, Matthew V., Jr.; and Martenas, Wayne B., 4,506,840, Cl. 241-101.700.

Martin, Joel L. Olefin polymerization. 4,507,449, Cl. 526-122.000.

Martin, John C.: *See*—
Verheyden, Julien P. H.; and Martin, John C., 4,507,305, Cl. 514-262.000.

Martinak, Bonifac. Device and method for repair of pot holes. 4,507,013, Cl. 404-75.000.

Maruta, Keiji: *See*—
Suzuki, Junichi; Maruta, Keiji; Noborimoto, Kazutaka; and Hineno, Satoshi, 4,507,765, Cl. 369-45.000.

Marvin Glass & Associates: *See*—
Terzian, Rouben T.; and Herbstler, Horst-Dieter, 4,507,098, Cl. 446-288.000.

Marx, Matthias: *See*—
Straehle, Wolfgang; Denni, Raymond; and Marx, Matthias, 4,507,475, Cl. 536-120.000.

Marzocchi, Alfred: *See*—
Lower, Loren D.; Marzocchi, Alfred; Ponn, Frederick H., III; and Roberts, Michael G., 4,507,365, Cl. 428-489.000.

Masaki, Kazuo; and Hiramatsu, Ryohei, to Nippondenso Co., Ltd. Solenoid-operated valve for selecting one of two pressure sources. 4,506,701, Cl. 137-596.170.

Masaki, Mitsuo: *See*—
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Masaki, Tomoh; Kamishiro, Toshiro; Okazoe, Takashi; Kumakura, Koichi; and Masaki, Mitsuo, to Nippon Chemiphar Co., Ltd. Piperazine derivatives and a medicine containing the same. 4,507,297, Cl. 514-252.000.

Mascaro, Thomas C. Method and apparatus for reconditioning and aerifying turf. 4,506,739, Cl. 172-21.000.

Masclet, Jean; and Veaux, Jacques, to Messier-Hispano-Bugatti. Dual chamber shock absorbers for aircrafts and the like. 4,506,869, Cl. 267-64.150.

Masco Corporation of Indiana: *See*—
Fathauer, George H.; Fowler, James M., Jr.; Rylicki, Edward J.; and Mason, Edwin E., 4,507,131, Cl. 55-104.000.

Masco Machine Incorporated: *See*—
Fedor, John W., 4,507,025, Cl. 408-6.000.

Mase, Syunzo; and Soejima, Shigeo, to Ngk Insulators, Ltd. High electric resistant zirconia and/or hafnia ceramics. 4,507,394, Cl. 501-94.000.

Mason, Edwin E.: *See*—
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Mason, Stanley I., Jr. Fruit bowl. 4,506,799, Cl. 220-69.000.

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Sakurada, Kazuyuki; Funyu, Yutaka; Togashi, Fusao; Kanno, Toyoji; and Masuda, Toshikazu, 4,506,531, Cl. 72-8.000.

Masui, Takatoshi: *See*—
Horii, Kingo; and Masui, Takatoshi, 4,506,638, Cl. 123-325.000.

Masunaga, Katsuro: *See*—
Miyazaki, Haruhiko; Shiomi, Yasushi; Fujitus, Satoru; Masunaga, Katsuro; and Yanagisawa, Hiroshi, 4,507,494, Cl. 560-193.000.

Matagne, Daniel M.: *See*—
Niebes, Paul J.; Matagne, Daniel M.; Hanon, Etienne P.; Roba, Joseph L.; and Lambelin, Georges E., 4,507,314, Cl. 514-456.000.

Mathers, James E.; and Yale, Ramon L., to GTE Products Corporation. Terbium-activated gadolinium oxysulfide X-ray phosphor. 4,507,560, Cl. 250-483.100.

Mathew, Chempolil T.; and Ulmer, Harry E., to Allied Corporation. Preparation from hydroxylammonium sulfate of oximes and hydroxamic acids via alcoholic hydroxylamine solution. 4,507,248, Cl. 260-500.50H.

Mathur, Krishna S., to Procor Limited. Method and apparatus for pelletizing sulphur. 4,507,335, Cl. 427-215.000.

Matsuda, Khoichi, to Pioneer Electronic Corporation. Frequency discriminating circuit. 4,507,578, Cl. 307-520.000.

Matsuda, Toshihiko; Takashi, Morihiko; and Yoshida, Mistuo, to Hitachi, Ltd. Control apparatus for rotation type storage device. 4,507,693, Cl. 360-72.200.

Matsui, Koichi: *See*—
Kambara, Koji; Misawa, Kazuo; Honda, Mikio; Matsui, Koichi; and Kohri, Kitijiro, 4,507,115, Cl. 604-135.000.

Matsumoto, Hisayoshi; and Fukuzawa, Takahiko, to Citizen Watch Co., Ltd. Printing timing correction device in shuttle type dot line printer. 4,507,002, Cl. 400-322.000.

Matsumoto, Takeshi; Yoshida, Shuji; and Shikimi, Katsuji, to Kabushiki Kaisha Komatsu Seisakusho. Track type vehicle providing for ready dismounting and remounting of power train components. 4,506,757, Cl. 180-294.000.

Matsumoto, Yoshio: *See*—
Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, 4,507,046, Cl. 414-735.000.

Matsumuro, Yasuhiko: *See*—
Utsunomiya, Tadashi; Matsumuro, Yasuhiko; and Saigo, Hideaki, 4,507,418, Cl. 524-318.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Gohara, Yoshihiro; Kanno, Masashi; and Yamashita, Ichiro, 4,507,523, Cl. 178-19.000.
Hirota, Yutaka; and Eguchi, Takashi, 4,507,687, Cl. 358-335.000.
Saimi, Tetsuo; and Yoshizumi, Keiichi, 4,507,766, Cl. 369-45.000.
Wakabayashi, Noriaki; Yamada, Kiichiro; and Onodera, Hiromi, 4,507,598, Cl. 318-687.000.

Matsushita Electronics Corporation: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,507,675, Cl. 357-70.000.

Matsushita, Masahiro, to Densaburo Sakai. Combined drill and reamer. 4,507,028, Cl. 408-230.000.

Matsushita, Souichi: *See*—
Kanda, Mutsumi; Inoue, Tokuta; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,506,632, Cl. 123-41.350.

Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,507,448, Cl. 526-125.000.

Matsuyama, Atsuo: *See*—
Ishiguro, Mamoru; Matsuyama, Atsuo; and Yamamura, Kazumasa, 4,507,691, Cl. 360-14.300.

Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic emulsion. 4,507,386, Cl. 430-549.000.

Matt, Timothy S.; and Wensink, James B., to Doboy Packaging Machinery, Inc. Wrapping machine and method. 4,506,488, Cl. 53-55.000.

Matthias, Dan W.; and Thornton, Richard D., to Exxon Research and Engineering Co. Character print wheel with drive elements. 4,507,000, Cl. 400-144.200.

Matthison-Hansen, John E. Roof or wall covering and mounting member for a gutter bracket. 4,506,479, Cl. 52-15.000.

Maurer, Thomas; Holbein, Hans-Jurgen; and Lass, Joseph S., to GAO Gesellschaft fur Automation und Organisation mbH. Multilayer identification card and a method of producing it. 4,507,346, Cl. 428-158.000.

Max, John K. Cold trap. 4,506,513, Cl. 62-55.500.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Wunsch, Erich, 4,507,235, Cl. 260-112.50R.

May & Baker Limited: *See*—
Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., 4,507,315, Cl. 514-396.000.

May, Carl B.: *See*—
Smithers, Richard; and May, Carl B., 4,506,982, Cl. 366-19.000.

McCann, James T.; Dobbins, Lawrence W.; and Reno, Charles W., to RCA Corporation. High efficiency precision laser beam switch. 4,507,773, Cl. 369-110.000.

McCarry, John D.: *See*—
Foley, William M., 4,507,452, Cl. 526-279.000.

McCaskill, Rex A.; McInroy, John W.; and Waldo, Paul D., to International Business Machines Corporation. Method for automatic field width expansion in a text processing system during interactive entry of displayed record selection criterium. 4,507,753, Cl. 364-900.000.

McCay, Johnny A.; Owens, Arthur H.; and Pfaffman, Jeffrey S., to Champion International Corporation. Core slabber. 4,506,575, Cl. 83-368.000.

McCollin, Chris D.; Allred, Richard E.; Bearl, Leslie K.; and Card, David C., to UOP Inc. Device for assembling jacketed lengths of pipe base well screens. 4,506,730, Cl. 166-85.000.

McConnell, Charles H., to Boeing Company, The. Engine installation for aircraft. 4,506,850, Cl. 244-54.000.

McCord, James W. Vapor generating and recovery apparatus. 4,506,520, Cl. 62-196.400.

McCoy, David R.: *See*—
Naylor, Carter G.; and McCoy, David R., 4,507,211, Cl. 252-8.55D.

McCracken, David R.; and Larson, Robin R., to Tektronix, Inc. Method and apparatus for synthesizing a drive signal for active IC testing including slew rate adjustment. 4,507,576, Cl. 307-475.000.

McCubbin, Charles E., to Baker Drilling Equipment Company. Cable tension measuring device. 4,506,555, Cl. 73-862.460.

McDermott Incorporated: *See*—
LeGlue, Michael J., 4,506,867, Cl. 254-108.000.

McElhaney, Kirk E. Curved surface suction mounting apparatus. 4,506,855, Cl. 248-206.200.

McElroy, David J., to Texas Instruments Incorporated. Avalanche fuse element as programmable device. 4,507,756, Cl. 365-104.000.

McElroy, David J., to Texas Instruments Incorporated. Avalanche fuse element in programmable memory. 4,507,757, Cl. 365-104.000.

McEwen, Stephen N.; and Guelde, Ted W., to Henry Filters, Inc. Check valve and pump receptor assembly. 4,507,061, Cl. 417-360.000.

McFiggans, Robert B.; and Muller, Arno, to Pitney Bowes Inc. Accessible housing for electronic system. 4,507,744, Cl. 364-708.000.

McGee, Thomas G.; and Hockmuth, Richard L., to Petroleum Meter & Pump Co., Ind. Indicator assembly for use with number wheel. 4,507,548, Cl. 235-94.00R.

McGraw-Edison Company: *See*—
Block, Thomas S., 4,506,405, Cl. 15-320.000.

McInroy, John W.: *See*—
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McKain, Rodger W.: *See*—
Dria, Dennis E.; Bremer, Noel J.; Dria, Myra A.; and McKain, Rodger W., 4,507,212, Cl. 252-8.55D.
McKenna, John J.; and Thompson, John M., to International Business Machines Corporation. In-place index compression. 4,507,752, Cl. 364-900.000.
McRowe, Arthur W.; and Brown, Randall J., to B. F. Goodrich Company, The. Smoke retardant vinyl halide polymer compositions. 4,507,414, Cl. 524-100.000.
Mead Corporation, The: *See*—
Adair, Paul C.; Duda, Homer G.; Burkholder, Amy L.; Wright, Richard F.; and Stanley, Mary M., 4,507,381, Cl. 430-246.000.
Measells, Paul E.: *See*—
Gajewski, Henry M.; Vernick, Barry H.; Measells, Paul E.; and Garber, Jan W., 4,507,387, Cl. 435-2.000.
Mecron medizinische Produkte GmbH: *See*—
Anapliotis, Emmanuel, 4,506,662, Cl. 128-92.0BC.
Medical Magnetics, Inc.: *See*—
Blechman, Abraham; and Pescatore, Eugene A., 4,507,084, Cl. 433-7.000.
Medtronic, Inc.: *See*—
Stokes, Kenneth B., 4,506,680, Cl. 128-786.000.
Mee, Alec: *See*—
Hayden, Percy; Mee, Alec; and Wright, Donald, 4,507,508, Cl. 568-487.000.
Megomat AG: *See*—
Schmid, Hans, 4,506,566, Cl. 81-9.510.
Meiattini, Franco: *See*—
Tabacco, Alessandro; and Meiattini, Franco, 4,507,388, Cl. 435-12.000.
Meier, Karl-Heinz: *See*—
Angersbach, Wolfgang; and Meier, Karl-Heinz, 4,507,596, Cl. 318-640.000.
Meighen, Terrence: *See*—
Brennan, Robert J.; and Meighen, Terrence, 4,506,944, Cl. 339-143.00R.
Meinan Machinery Works, Inc.: *See*—
Iwamoto, Masakuni, 4,507,162, Cl. 156-157.000.
Meissner Manufacturing Company, Inc.: *See*—
Meissner, Paul J., 4,507,200, Cl. 210-315.000.
Meissner, Paul J., to Meissner Manufacturing Company, Inc. Fluid filter cartridge and method of its construction. 4,507,200, Cl. 210-315.000.
Meister, Siegfried. Apparatus for the heating of foodstuffs by means of a steam-air mixture. 4,506,598, Cl. 99-330.000.
Melas, Andreas A.; and O'Grady, John W., Jr., to Thiokol Corporation. Bubbler cylinder and dip tube device. 4,506,815, Cl. 222-630.000.
Melzer, Hans-Harald, to Bayerische Motoren Werke A.G. Diesel internal combustion engine with soot burn-off device. 4,506,505, Cl. 60-278.000.
Melzer, Milena: *See*—
Kohl, Albert; Schneider, Norbert; Ley, Gregor; Balz, Werner; Melzer, Milena; and Jakusch, Helmut, 4,507,457, Cl. 427-48.000.
Menard, Michael J., to Johnson & Johnson Baby Products Company. Imparting an inelastic and elastic character to predetermined portions of an elastic web for use in making disposable diapers. 4,507,163, Cl. 156-164.000.
Mendiratta, Ashok K.; and Morgan, Wayne F., to General Electric Company. Purification of bisphenol-A. 4,507,509, Cl. 568-724.000.
Mera, Hiroshi: *See*—
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Werquin, Jean C.; and Mercier, Bernard, 4,507,366, Cl. 428-682.000.
Mercier, Jacques H., to Normand Trust, The. Method of making pressure resistant accumulator device. 4,506,431, Cl. 29-454.000.
Merck & Co., Inc.: *See*—
Johnston, David B. R., 4,507,299, Cl. 514-255.000.
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Reiff, Friedrich; Hartner, Hartmut; Basedow, Arno; Hugenbusch, Hans-Wolfgang; Schmidt, Peter C.; and Bardonner, Hans, 4,507,511, Cl. 568-852.000.
Merrifield, Robert B.: *See*—
Tam, James P.; Heath, William F., Jr.; and Merrifield, Robert B., 4,507,230, Cl. 260-112.50R.
Meschi, Luciano, to Wully, S.A. Apparatus for reception and transfer of sheet material. 4,507,109, Cl. 493-356.000.
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Rohm, Ernst, 4,507,699, Cl. 361-50.000.
Messier-Hispano-Bugatti: *See*—
Masclet, Jean; and Veaux, Jacques, 4,506,869, Cl. 267-64.150.
Messina, Anthony: *See*—
Kingsbury, Charles M.; Beckwith, Bruce R.; and Messina, Anthony, 4,507,138, Cl. 65-158.000.
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Blau, Heinrich; Gortz, Bernd; Grohmann, Werner; Meusel, Wolfgang; Niebergall, Heribert; and Waldmann, Hermann, 4,507,703, Cl. 361-193.000.
Meyer, Fritz, to Siemens Aktiengesellschaft. Generating quasi-random sequences in AMI code. 4,507,621, Cl. 331-78.000.
Meyer, Raymond A.; Howard, Frederick S.; and Brugger, John E., to United States of America, Administrator Environmental Protection Agency. Method and apparatus for generating monopulse ultrasonic signals. 4,507,762, Cl. 367-137.000.
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Panster, Peter; Michel, Rudolf; Kleinschmit, Peter; and Deschler, Ulrich, 4,507,490, Cl. 556-427.000.
Michigan Technological University, Board of Control of: *See*—
Kilpela, Tauno B., 4,506,778, Cl. 198-382.000.
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Niebes, Paul J.; Matagne, Daniel M.; Hanon, Etienne P.; Roba, Joseph L.; and Lambelin, Georges E., 4,507,314, Cl. 514-456.000.
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Quin, Rene A.; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, 4,506,863, Cl. 251-149.900.
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Sortwell, Edwin T.; Slovinsky, Manuel; and Mikkelsen, Alan R., 4,507,470, Cl. 528-499.000.
Miksitz, Frank J., to UFI Engineering & Manufacturing Co., Inc. Mechanical construction arrangement for rotary plow feeder. 4,506,811, Cl. 222-411.000.
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Miller, Jeffrey T.; and Nevitt, Thomas D., to Standard Oil Company (Indiana). Cadmium-containing catalyst. 4,507,399, Cl. 502-63.000.
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Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,507,459, Cl. 528-64.000.
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Kluger, Edward W.; and Moore, Patrick D., 4,507,407, Cl. 521-113.000.
Mills, John G., II: *See*—
Waters, John, Jr., 4,506,473, Cl. 43-107.000.
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Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,507,539, Cl. 219-121.0PY.
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Minato, Osamu: *See*—
Yasui, Tokumasa; Nakamura, Hideaki; Uchibori, Kiyofumi; Tanimura, Nobuyoshi; and Minato, Osamu, 4,507,759, Cl. 365-189.000.
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Lequeux, Michel L., 4,507,038, Cl. 414-27.000.
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Hamasaki, Masanobu, 4,507,540, Cl. 219-121.0LD.
Nara, Koichi, 4,506,996, Cl. 374-176.000.
Toibana, Yasuo; and Ueno, Kazuo, 4,507,224, Cl. 252-516.000.
Minks, Werner, to International Standard Electric Corporation. Sealing means for an electromagnetic relay. 4,507,633, Cl. 335-202.000.
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Crawford, Dennis L.; and Mitchell, Donald J., 4,506,576, Cl. 83-455.000.
Reilly, Laurence W., Jr., 4,507,497, Cl. 562-441.000.
Rousseau, Alan D.; Fohrenkamm, Elsie A.; and Kausch, William L., 4,507,382, Cl. 430-275.000.
Minolta Camera Kabushiki Kaisha: *See*—
Oka, Tateki, 4,506,804, Cl. 222-64.000.
Sugiura, Masamichi; and Shibazaki, Kenji, 4,506,974, Cl. 355-14.00R.
Mion, Jean-Luc: *See*—
Capdebosco, Bernard; and Mion, Jean-Luc, 4,506,875, Cl. 271-99.000.
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Hessel, William; Niemeyer, Wayne D.; Misra, Surya K.; and Openchowski, Richard A., 4,506,533, Cl. 72-42.000.
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Cameto, L. Robert; and Jepson, Robert M., 4,506,511, Cl. 62-3.000.
Misumi, Teruo: *See*—
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,507,375, Cl. 430-128.000.
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition comprising polyether having silyl group. 4,507,469, Cl. 528-425.000.

Mitachi, Senshu: *See*—
Ozaki, Yoshiharu; Kaneko, Kimiyoshi; and Mitachi, Senshu, 4,507,245, Cl. 260-429.200.

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Crawford, Dennis L.; and Mitchell, Donald J., 4,506,576, Cl. 83-455.000.

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Mitchell, Rodger. Tape measure having two tapes. 4,506,446, Cl. 33-139.000.

Mitomi, Seiji, to Nifco Inc. Part-fixing clip. 4,506,419, Cl. 24-297.000.

Mitsubishi Chemical Industries Limited: *See*—
Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kojima, Kazuhisa, 4,507,450, Cl. 526-128.000.
Kuriyama, Shizuo; and Saitoh, Mikio, 4,507,322, Cl. 514-648.000.
Niwa, Toshio; Himeno, Kiyoshi; and Hihara, Toshio, 4,507,476, Cl. 544-187.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Asano, Tadashi; Suzuki, Tadashi; and Fujii, Tadatsugu, 4,506,521, Cl. 62-238.700.
Fujiwara, Yukio; Sonoyama, Seiji; and Imataki, Mitsumasa, 4,507,701, Cl. 361-127.000.
Hamano, Isao, 4,507,565, Cl. 290-38.00R.
Ukai, Jun; and Shimizu, Takao, 4,507,543, Cl. 219-137.0PS.
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Yagi, Shigenori; Ogawa, Shuji; Kuzumoto, Masaki; and Tabata, Norikazu, 4,507,537, Cl. 219-121.0LA.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Asakawa, Kazuo, 4,507,403, Cl. 518-713.000.
Yoshinaka, Shigeo; Toki, Tsukasa; Tsuji, Tomoji; and Uchiyama, Seiji, 4,507,510, Cl. 568-811.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Hiramatsu, Takeo, 4,506,563, Cl. 74-867.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Koike, Naomasa; and Hiraishi, Shigetoshi, 4,507,671, Cl. 346-216.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sasaki, Isao; Ii, Yasuaki; and Mori, Hiroshi, 4,507,423, Cl. 524-427.000.

Mitsui Petrochemical Industries: *See*—
Nagata, Michiaki; and Nakashima, Koji, 4,507,348, Cl. 428-172.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Nakayama, Shigenobu; Noda, Eiichi; Noguchi, Yoshiaki; Yamamoto, Isamu; and Kawasaki, Noboru, 4,507,500, Cl. 564-340.000.

Mittermeier, Walter, to Dr. Ing. h.c.F. Porsche A.G. Hydraulic chain tensioner. 4,507,103, Cl. 474-110.000.

Miura, Isao: *See*—
Takaoka, Michio; Moutai, Tsuneaki; and Miura, Isao, 4,507,358, Cl. 428-298.000.

Miura, Norio: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,507,563, Cl. 250-486.100.

Mixer Systems, Inc.: *See*—
Strehlow, Robert W., 4,506,984, Cl. 366-65.000.

Miyagi, Takeshi, to Zojirushi Baby Co., Ltd. Baby carriage. 4,506,907, Cl. 280-642.000.

Miyake, Noriaki: *See*—
Ban, Keisuke; Arai, Takeo; Sakakibara, Tatsuo; and Miyake, Noriaki, 4,506,721, Cl. 164-97.000.

Miyamoto, Kenzo, deceased: *See*—
Ohminato, Kiyoshi; and Miyamoto, Kenzo, deceased, 4,506,416, Cl. 24-67.00R.

Miyamoto, Toshiko, executor: *See*—
Ohminato, Kiyoshi; and Miyamoto, Kenzo, deceased, 4,506,416, Cl. 24-67.00R.

Miyashiro, Shigeyoshi: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Shimizu, Eikou; and Shiio, Tsuyoshi, 4,507,282, Cl. 424-117.000.

Miyauchi, Toshiaki; and Yoneda, Osamu, to Tokusen Kogyo Kabushiki Kaisha. Steel cord for reinforcing a rubber structure. 4,506,500, Cl. 57-212.000.

Miyazaki, Haruhiko; Shiomi, Yasushi; Fujitus, Satoru; Masunaga, Katsuro; and Yanagisawa, Hiroshi, to Ube Industries, Ltd. Process for the production of a diester of oxalic acid. 4,507,494, Cl. 560-193.000.

Miyazaki, Kaoru: *See*—
Saito, Hiraku; Suzuki, Yasuo; Fujii, Katsumi; Miyazaki, Kaoru; and Horio, Takekazu, 4,507,233, Cl. 260-115.000.

Miyazaki, Kiyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Brushless DC motor. 4,507,590, Cl. 318-254.000.

Miyoshi, Isao: *See*—
Abe, Masaru; Miyoshi, Isao; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,506,718, Cl. 152-361.00R.

Miyoshi, Masanobu: *See*—
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,507,386, Cl. 430-549.000.

Miyoshi, Mitsuji: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,507,448, Cl. 526-125.000.

Mizuno, Koji: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Mizuno, Toshiaki: *See*—
Murakami, Kazuhiro; Yamazoe, Hisamitsu; and Mizuno, Toshiaki, 4,506,639, Cl. 123-339.000.

Mizutani, Shoji: *See*—
Higo, Tsutomu; Mizutani, Shoji; Sawada, Yasuhiro; and Kengaku, Katsumi, 4,507,265, Cl. 422-186.000.

Mobil Oil Corporation: *See*—
Braid, Milton; and Horodysky, Andrew G., 4,507,216, Cl. 252-49.600.
Dion, Eric P., 4,507,613, Cl. 324-340.000.
Suek, Edmond L., 4,507,435, Cl. 525-86.000.
Zemanek, Joseph, Jr., 4,506,548, Cl. 73-152.000.

Mochida Seiyaku Kabushiki Kaisha: *See*—
Niimura, Isao; Maeda, Shigeo; and Okazaki, Hideo, 4,507,237, Cl. 260-157.000.

Modulite Corporation: *See*—
Castillo, Richard A., 4,506,427, Cl. 29-433.000.

Moertl, Willi: *See*—
Novak, Peter; and Moertl, Willi, 4,506,780, Cl. 198-483.000.

Moeschwitzer, Albrecht, to VEB Zentrum fur Forschung und Technologie Mikroelektronik im VEB Kombinat Mikroelektronik. Semiconductor memory element with two field effect transistors. 4,507,758, Cl. 365-182.000.

Moffitt, Merritt L., Jr. Side handle reservoir brush. 4,507,004, Cl. 401-275.000.

Mohri, Katsuo: *See*—
Azuma, Nobuo; Satoh, Kenji; Mohri, Katsuo; and Furuhata, Takashi, 4,507,690, Cl. 360-33.100.

Molrose Management, Ltd.: *See*—
Bedard, Pierre, 4,506,394, Cl. 3-1.500.

Mondek, Martin J.: *See*—
Hall, Charles B.; and Mondek, Martin J., 4,507,092, Cl. 440-89.000.

Monett, Edward, to Roller Corporation of America. Impact resistant assembly. 4,507,035, Cl. 411-377.000.

Monkovic, Ivo; and Crenshaw, Ronnie R., to Bristol-Myers Company. 3,4-Disubstituted-1,2,5-oxadiazoles having histamine H_2-receptor antagonist activity. 4,507,485, Cl. 546-210.000.

Monsanto Company: *See*—
Higginbottom, Harold P.; and Drumm, Manuel F., 4,507,428, Cl. 524-596.000.
Olive', Salvador; and Olive', Gisela, 4,507,324, Cl. 428-375.000.
Schafer, David E.; and Czajkowski, Albert J., 4,507,143, Cl. 71-87.000.
Weingarten, Harold I., 4,507,389, Cl. 435-23.000.

Moon, Edward L.: *See*—
Koenig, Alan R.; and Moon, Edward L., 4,507,197, Cl. 209-2.000.

Mooney Chemicals, Inc.: *See*—
Collins, Albert V.; and Asmus, Richard W., 4,507,152, Cl. 106-18.310.

Moonie, Gary A.: *See*—
Waggoner, Clinton A.; Dominique, Harry P.; Moonie, Gary A.; and Kaye, Bruce J., 4,506,960, Cl. 350-529.000.

Moore, Patrick D.: *See*—
Kluger, Edward W.; and Moore, Patrick D., 4,507,407, Cl. 521-113.000.

Moore, Robert R.: *See*—
Andrews, E. Trent; Lamb, Steve R.; and Moore, Robert R., 4,506,665, Cl. 128-202.270.

Moorehead, Robert M.; Eppler, Susan G.; and Anderson, Mardis V., to Trans-Texas Energy, Inc. Method and apparatus for monitoring and controlling well drilling parameters. 4,507,735, Cl. 364-422.000.

Moormann, Rainer: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.

Morey, William A.; and Tonneson, Ronald J., to Rockwell International Corporation. Character/vector controller for stroke written CRT displays. 4,507,656, Cl. 340-739.000.

Morgan, Wayne F.: *See*—
Mendiratta, Ashok K.; and Morgan, Wayne F., 4,507,509, Cl. 568-724.000.

Morganroth, Shila. Hair bleaching art. 4,506,783, Cl. 206-581.000.

Mori, Hiroshi: *See*—
Sasaki, Isao; Ii, Yasuaki; and Mori, Hiroshi, 4,507,423, Cl. 524-427.000.

Mori, Kenzo; and Ozawa, Mikio, to Taiyo Musen Co. Ltd. Automatic direction finder. 4,507,663, Cl. 343-440.000.

Mori, Shigeki: *See*—
Shinomiya, Tsutomu; Mori, Shigeki; and Higuchi, Hiroshi, 4,506,577, Cl. 83-499.000.

Mori, Susumu; and Yamada, Hideaki, to Nippon Electric Co., Ltd. NAND Logic gate circuit having improved response time. 4,507,575, Cl. 307-456.000.

Mori, Yasuki: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Morishita, Hirosada: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Morishita, Katsuji: *See*—
Shiroyama, Shoichi; Yamashita, Kazuo; and Morishita, Katsuji, 4,506,868, Cl. 267-3.000.

Morita, Masao; Tanaka, Akinobu; Imamura, Saburo; Tamamura, Toshiaki; and Kogure, Osamu, to Nippon Telegraph & Telephone

Public Corporation. Pattern forming material and method for forming pattern therewith. 4,507,384, Cl. 430-311.000.

Morris, Robert A.; Kiesel, George W.; Rajotte, Paul T.; and Richards, Anthony L., to General Electric. Electrical interconnect arrangement for a GFCI magnetic sensor module plug-in subassembly. 4,507,709, Cl. 361-400.000.

Morrison, Brian D., to Raytheon Company. Bidirectional data byte aligner. 4,507,731, Cl. 364-200.000.

Morse, Robert L.; and Hagan, Russell M., to Tecumseh Products Company. Hermetic compressor discharge line thermal block. 4,506,519, Cl. 62-190.000.

Morse, Theodore F., to Corning Glass Works. Method of making optical fiber preform. 4,507,135, Cl. 65-3.120.

Mosimann, David; Walther, Theodor; and Schnider, Jean-Pierre, to Bien-Air. Dental instrument with handpiece. 4,507,085, Cl. 433-126.000.

Mostek Corporation: *See—*
Brown, Clyde O.; and Tourtellotte, Raymond E., 4,507,538, Cl. 219-121.00L.
Graham, Andrew C., 4,507,761, Cl. 365-230.000.

Motorola, Inc.: *See—*
Mahabadi, John K.; and Ehrlich, Victor D., 4,507,570, Cl. 307-273.000.
Wagner, Carl M., 4,507,795, Cl. 375-95.000.

Motosugi, Takanori; Sakai, Hisashi; and Iiyama, Kiyotaka, to Ricoh Company, Ltd. Thermosensitive recording material. 4,507,670, Cl. 346-208.000.

Motosugi, Takanori: *See—*
Sakamoto, Hiroshi; Koseki, Yoshihiro; Motosugi, Takanori; and Inaba, Norihiko, 4,507,669, Cl. 346-207.000.

Motta, Gianni: *See—*
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, 4,507,308, Cl. 514-313.000.

Mount Isa Mines Limited: *See—*
Cunningham, Jock B., 4,506,541, Cl. 73-32.00R.

Moutai, Tsuneaki: *See—*
Takaoka, Michio; Moutai, Tsuneaki; and Miura, Isao, 4,507,358, Cl. 428-298.000.

Mouzin, Gilbert: *See—*
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,507,318, Cl. 514-531.000.

MTU-Motoren- Und Turbinen-Union Friedrichshafen GmbH: *See—*
van Rinsum, Cornelis, 4,506,635, Cl. 123-90.220.

Mucheyer, Norbert: *See—*
Schmidt, Hubertus; and Mucheyer, Norbert, 4,506,859, Cl. 251-63.000.

Mueller Co.: *See—*
Daghe, Joseph L.; and Sands, Robert E., 4,506,694, Cl. 137-218.000.

Mukai, Kunio: *See—*
Yamada, Yoshimi; Ooishi, Tadashi; Kato, Toshiro; and Mukai, Kunio, 4,507,284, Cl. 514-140.000.

Mukoo, Akio: *See—*
Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.

Mullen, Charles K.; Shepherd, Gary D.; Fernandez, Ramon B.; and Bergren, Kenneth B., to Hitco. Method of purifying partially carbonized pan material prior to carbonization. 4,507,272, Cl. 423-447.400.

Muller, Adam. Clear tobacco aroma oil, a process for obtaining it from a tobacco extract, and its use. 4,506,682, Cl. 131-297.000.

Muller, Arno: *See—*
McFiggans, Robert B.; and Muller, Arno, 4,507,744, Cl. 364-708.000.

Mundell, Peter J., to South African Inventions Development Corporation. Surgical implant. 4,506,681, Cl. 128-92.00D.

Munemitsu, Toshiaki: *See—*
Makita, Muneharu; Oseto, Osamu; and Munemitsu, Toshiaki, 4,507,376, Cl. 430-109.000.

Munzer, Manfred: *See—*
Slawyk, Wilhelm; Balle, Gerhard; Munzer, Manfred; and Wohnhas, Adolf, deceased, 4,507,444, Cl. 525-455.000.

Murakami, Kazuhiro; Yamazoe, Hisamitsu; and Mizuno, Toshiaki, to Nippondenso Co., Ltd. Method and system for controlling the idle speed of an internal combustion engine at variable ignition timing. 4,506,639, Cl. 123-339.000.

Murakami, Reiji; Uchida, Kohachi; Nakatomi, Yoshitsugu; and Takahashi, Tomohiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Developing device with means to prevent scattering. 4,506,972, Cl. 355-3.0DD.

Murakami, Yasushi: *See—*
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Murata, Bunjiro: *See—*
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,507,627, Cl. 333-105.000.

Murata, Hideki: *See—*
Wada, Tsuneo; Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; and Takagiwa, Hiroyuki, 4,507,378, Cl. 430-137.000.

Murata Manufacturing Co., Ltd.: *See—*
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,507,627, Cl. 333-105.000.
Wakino, Kikuo, 4,507,630, Cl. 333-182.000.

Murata, Toshio; Kushida, Hachiro; and Irie, Kenji, to Citizen Watch Co., Ltd. Method for finishing matted surface on a metal-made article for personal ornament. 4,507,184, Cl. 204-129.350.

Murley, Jackie D.: *See—*
Hahn, Granville J.; Rutledge, Raleigh N.; and Murley, Jackie D., 4,507,071, Cl. 425-133.100.

Muro, Hideo: *See—*
Hoshino, Shigeo; Takenaka, Kazuhiro; and Muro, Hideo, 4,507,705, Cl. 361-283.000.

Murphy, Gregory E.: *See—*
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,507,137, Cl. 65-109.000.

Murphy, Stephen B. Method of prosthesis design. 4,506,393, Cl. 3-1.000.

Murray, Clarence L.; and Bright, John T., to Foundation Control Systems, Inc. Apparatus for positioning and stabilizing a concrete slab. 4,507,069, Cl. 425-59.000.

Murray, Robert J.: *See—*
Davidson, Thomas A.; and Murray, Robert J., 4,507,481, Cl. 546-121.000.

Murray, Wayne A.: *See—*
Fortune, William S.; and Murray, Wayne A., 4,507,546, Cl. 219-497.000.

Murrill, William D.; and Langseth, Bryan, to Calavar Corporation. Extensible boom construction for self-propelled aerial work platforms. 4,506,480, Cl. 52-121.000.

Murry, Edward J. Electronic dice game. 4,506,890, Cl. 273-138.00A.

Murtha, Timothy P., to Phillips Petroleum Company. Catalysts. 4,507,507, Cl. 568-401.000.

Musashi Co., Ltd.: *See—*
Ito, Yukio; and Koshio, Yoshihiro, 4,506,882, Cl. 271-303.000.

Muscari, Raymond F., to International Beverage Supply, Inc. Merchandise support. 4,506,790, Cl. 211-59.400.

Musha, Tohru, to Olympus Optical Co., Ltd. Objective lens drive device with tracking error correction with flux of opposite direction. 4,507,764, Cl. 369-45.000.

Musil, Gerhard: *See—*
Ziegler, Alfred; and Musil, Gerhard, 4,507,568, Cl. 307-112.000.

Mussini, Emilio: *See—*
Vecchietti, Vittorio; Mussini, Emilio; and Ferrari, Giorgio, 4,507,307, Cl. 514-313.000.

Muth, Robert N., to Hazeltine Corporation. Oscillator utilizing inductive parameter of transistor. 4,507,622, Cl. 331-115.000.

Myers, Earl C., Jr.: *See—*
Cosmos, Pete; and Myers, Earl C., Jr., 4,506,937, Cl. 339-14.00R.

Myhre, Kjell E. Optimized stress and strain distribution diaphragms. 4,507,170, Cl. 156-633.000.

Myooi, Tetsuo: *See—*
Haneda, Isamu; and Myooi, Tetsuo, 4,507,743, Cl. 364-709.000.

Nachtkamp, Klaus: *See—*
Potter, Terry A.; Nachtkamp, Klaus; and Weider, Franz, 4,507,427, Cl. 524-591.000.

Nadella: *See—*
Mallet, Bernard, 4,507,007, Cl. 403-157.000.

Nader, Reinhard: *See—*
Bernert, Claus-Rudiger; Kirchner, Hans-Gert; and Nader, Reinhard, 4,507,473, Cl. 536-86.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Current source circuit for producing a small value output current proportional to an input current. 4,507,573, Cl. 307-297.000.

Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, to Hitachi, Ltd. Electronic controlled fuel injection system and injection timing control method therefor. 4,506,646, Cl. 123-501.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed control device for a bicycle. 4,507,101, Cl. 474-82.000.

Nagase, Yasuo: *See—*
Haruki, Kazuhito; Kohno, Takeshi; and Nagase, Yasuo, 4,507,739, Cl. 364-478.000.

Nagata, Michiaki; and Nakashima, Koji, to Mitsui Petrochemical Industries. Corrugated board-like sheet made of synthetic resin. 4,507,348, Cl. 428-172.000.

Nagata, Yoichi: *See—*
Ishikawa, Toshikatsu; Ichikawa, Hiroshi; Imai, Yoshikazu; Hayase, Tokuji; and Nagata, Yoichi, 4,507,354, Cl. 428-245.000.

Nagl, Martin, to Voest-Alpine Aktiengesellschaft. Apparatus for discharging solids from a shaft furnace. 4,507,079, Cl. 432-95.000.

Naito, Hideki; Hara, Hiroshi; Sato, Kozo; and Yabuki, Yoshiharu, to Fuji Photo Film Co., Ltd. Heat-developable color photographic material containing dye releasing couplers. 4,507,380, Cl. 430-203.000.

Naito, Shiro: *See—*
Yamanaga, Junichi; and Naito, Shiro, 4,506,441, Cl. 29-787.000.

Naito, Takayuki: *See—*
Kamachi, Hajime; Okumura, Jun; Naito, Takayuki; Oka, Masahisa; and Yamashita, Haruhiro, 4,507,487, Cl. 548-194.000.

Nakabayashi, Takao: *See—*
Shigenobu, Hiromichi; Nakabayashi, Takao; Akiyama, Kitio; Miida, Masao; and Karasawa, Hisashi, 4,506,596, Cl. 99-289.00T.

Nakagawa, Katsumi: *See—*
Hirai, Yutaka; Komatsu, Toshiyuki; Nakagawa, Katsumi; Misumi, Teruo; and Fukuda, Tadaji, 4,507,375, Cl. 430-128.000.

Nakamura, Hideaki: *See—*
Yasui, Tokumasa; Nakamura, Hideaki; Uchibori, Kiyofumi; Tanimura, Nobuyoshi; and Minato, Osamu, 4,507,759, Cl. 365-189.000.

Nakamura, Keiichi; Asao, Hiroshi; Okada, Kenichi; Wakabayashi, Yoichi; and Ochiai, Izumi, to Hitachi, Ltd. Method of producing a fluid pressure reducing device. 4,506,423, Cl. 29-157.00R.

Nakamura, Morio: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; and Fujikake, Masato, 4,507,438, Cl. 525-119.000.
Nakamura, Teruo: *See*—
Shibuya, Tsunenori; and Nakamura, Teruo, 4,507,065, Cl. 418-15.000.
Nakamura, Toru: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,507,448, Cl. 526-125.000.
Nakamura, Yoshiharu; and Kanda, Mikio, to Nissan Motor Company, Limited; and Nisssan Shatai Company, Limited. Mounting structure for anchor of automotive seat belt. 4,506,911, Cl. 280-801.000.
Nakanishi, Hirotazu: *See*—
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, 4,507,469, Cl. 528-425.000.
Nakanishi, Kiyoshi: *See*—
Kanda, Mutsumi; Inoue, Tokuta; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,506,632, Cl. 123-41.350.
Nakaoka, Eiichi, to Shimadzu Corporation. Apparatus for electromagnetically detecting flaws in metallic objects. 4,507,610, Cl. 324-238.000.
Nakashima, Koji: *See*—
Nagata, Michiaki; and Nakashima, Koji, 4,507,348, Cl. 428-172.000.
Nakashima, Noriyuki; and Ishiguro, Yoshinori, to Nippondenso Co., Ltd. Shock absorber control system and method of controlling the same. 4,506,909, Cl. 280-707.000.
Nakatomi, Yoshitsugu: *See*—
Murakami, Reiji; Uchida, Kohachi; Nakatomi, Yoshitsugu; and Takahashi, Tomohiko, 4,506,972, Cl. 355-3.0DD.
Nakayama, Shigenobu; Noda, Eiichi; Noguchi, Yoshiaki; Yamamoto, Isamu; and Kawasaki, Noboru, to Mitsui Toatsu Chemicals, Inc. Process for producing 2-mercaptoethylamine hydrohalides. 4,507,500, Cl. 564-340.000.
Naoe, Masahiko: *See*—
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, 4,507,364, Cl. 428-457.000.
Nara, Koichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Cryogenic thermometer. 4,506,996, Cl. 374-176.000.
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, to Recordati S.A. Analgesically or anti-inflammatory effective 4-quinolyl anthranilic acid derivatives. 4,507,308, Cl. 514-313.000.
Nardozzi, Michael, Jr. Golf putter with interchangeable shafts and heads. 4,506,888, Cl. 273-80.100.
Naruse, Akisuke: *See*—
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.
Nason, William C.: *See*—
Carson, Matthew; LeMahieu, Ronald A.; and Nason, William C., 4,507,498, Cl. 562-463.000.
Nasserian, Mojtaba: *See*—
Lew, Wing G.; Deutsch, Richard A.; and Nasserian, Mojtaba, 4,507,034, Cl. 411-21.000.
Nath, Prem; Barnard, Timothy J.; and Crea, Dominic, to Energy Conversion Devices, Inc. Method of electro-coating a semiconductor device. 4,507,181, Cl. 204-15.000.
National Industri A/S: *See*—
Eilertsen, Odd J.; and Svensen, Ottar H., 4,507,636, Cl. 336-12.000.
Nattermann & Cie GmbH: *See*—
Ghyczy, Miklos; Imberge, Paul-Robert; and Wendel, Armin, 4,506,831, Cl. 239-10.000.
Naylor, Carter G.; and McCoy, David R., to Texaco, Inc. Oil recovery method utilizing an alkylphenyl ether propane sulfonate. 4,507,211, Cl. 252-8.55D.
Naylor, Kenneth C.: *See*—
Friedrich, Ralph S.; and Naylor, Kenneth C., 4,506,918, Cl. 285-156.000.
NCR Corporation: *See*—
Bashford, Anthony J., 4,506,878, Cl. 271-227.000.
NDK, Incorporated: *See*—
Bowermaster, Sidney P., 4,506,903, Cl. 280-289.0WC.
Neal, Archie E., to J. E. Love Co. Subsoil rotary cultivator. 4,506,610, Cl. 111-87.000.
Negre, Guy; and Fayard, Jean-Claude, to Elf France. Device for controlling a gas circuit of a combustion chamber and a sealing member for its operation. 4,506,636, Cl. 123-190.00A.
Neier, Benjamin R.; and Stirling, Donald L., to Stirco Inc. Mixer for fluent and nonfluent material. 4,506,990, Cl. 366-299.000.
Nelligan, William B.: *See*—
Hertzog, Russel C.; and Nelligan, William B., 4,507,554, Cl. 250-270.000.
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Hara, Kunio, 4,506,417, Cl. 24-115.00G.
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Koike, Tatsuhiro, 4,506,580, Cl. 84-1.010.
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Nippon Light Metal Company Limited: *See*—
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Masaki, Kazuo; and Hiramatsu, Ryohei, 4,506,701, Cl. 137-596.170.
Murakami, Kazuhiro; Yamazoe, Hisamitsu; and Mizuno, Toshiaki, 4,506,639, Cl. 123-339.000.
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Niwa, Toshio; Himeno, Kiyoshi; and Hihara, Toshio, to Mitsubishi Chemical Industries Limited. Anthraquinone dyestuffs for cellulose-containing fibers. 4,507,476, Cl. 544-187.000.
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Nogami, Masaharu, to Fujitsu Limited. Method and apparatus for vapor phase growth of a semiconductor. 4,507,169, Cl. 156-606.000.
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Nolan, James D. Methods for coating the glass envelope and predetermined portions of the end caps of a fluorescent lamp. 4,507,332, Cl. 427-67.000.
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Norvell, James H. Buoy device for automatic raising of submerged objects. 4,507,093, Cl. 441-2.000.
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Oakley, Tony D. Method of manufacture of warp-resistant necks for stringed instruments. 4,506,584, Cl. 84-293.000.
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Ohhashi, Masahide, to Tokyo Shibaura Denki Kabushiki Kaisha. Two's complement multiplier circuit. 4,507,749, Cl. 364-757.000.
Ohminato, Kiyoshi; and Miyamoto, Kenzo, deceased (by Miyamoto, Toshiko, executor), to King Jim Co., Ltd. Paper clip. 4,506,416, Cl. 24-67.00R.
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Okuyama, Genichiro; Takemoto, Shizume; and Otani, Yasuhisa, to Kanebo, Ltd. Cosmetic compositions of the oil-in-water emulsion type. 4,507,279, Cl. 424-63.000.

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Olson, Darrel L. Hand grip and stirrup support device for bareback horse riding. 4,506,496, Cl. 54-44.000.

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Olympus Optical Co., Ltd.: *See*—
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Ono, Eiichi; and Aoki, Akio, to Nissan Motor Company, Limited. Wiper-mounted retractable head lamp assembly. 4,507,711, Cl. 362-61.000.

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Openchowski, Richard A.: *See*—
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Orban, Ivan, to Ciba-Geigy Corporation. Process for producing polyesters from aliphatic dicarboxylic acids and polyalkylpiperidyldiols. 4,507,463, Cl. 528-279.000.

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Otis Engineering Corporation: *See*—
Gentry, Ernest B., 4,506,858, Cl. 251-1.00A.

Otsuka, Kazuo: *See*—
Igarashi, Michiaki; Inui, Takayasu; Otsuka, Kazuo; Nogami, Saburo; and Nishimura, Satoru, 4,507,057, Cl. 417-216.000.

Otter Controls Limited: *See*—
Blackburn, Arthur M., 4,507,642, Cl. 337-89.000.

Ottermann, Hans-Gert: *See*—
Heims, Dirk; Ottermann, Hans-Gert; and Prang, Robert, 4,507,014, Cl. 404-102.000.

Otto Bock Orthopadische Industrie KG: *See*—
Haupt, Werner, 4,506,395, Cl. 3-6.000.

Outboard Marine Corporation: *See*—
Hall, Charles B.; and Mondek, Martin J., 4,507,092, Cl. 440-89.000.
Hunt, Paul R.; and DuBois, Chester G., 4,506,649, Cl. 123-576.000.

Overton, James R.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,507,493, Cl. 560-103.000.

Owens, Arthur H.: *See*—
McCay, Johnny A.; Owens, Arthur H.; and Pfaffman, Jeffrey S., 4,506,575, Cl. 83-368.000.

Owens-Corning Fiberglas Corporation: *See*—
Lower, Loren D.; Marzocchi, Alfred; Ponn, Frederick H., III; and Roberts, Michael G., 4,507,365, Cl. 428-489.000.
Roehrig, Frederick K., 4,507,156, Cl. 148-11.50P.

Owens-Illinois, Inc.: *See*—
Babington, Robert L.; and Babington, Robert S., 4,507,074, Cl. 431-12.000.
Babington, Robert S., 4,507,076, Cl. 431-117.000.
Edwards, Ralston G., Jr.; Walkden, John R. B.; Carstensen, Walter H.; Murphy, Gregory E.; and Lisi, John E., 4,507,137, Cl. 65-109.000.

Owerko, John R.: *See*—
Stolarczyk, Larry G.; and Owerko, John R., 4,507,654, Cl. 340-545.000.

Oy Tampella AB: *See*—
Lehtinen, Jukka, 4,506,456, Cl. 34-12.000.
Lehtinen, Jukka, 4,506,457, Cl. 34-41.000.

Oyama, Noboru: *See*—
Shimomura, Takeshi; Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Oyama, Noboru, 4,507,194, Cl. 204-435.000.

Ozaki, Yoshiharu; Kaneko, Kimiyoshi; and Mitachi, Senshu, to Hokko Chemical Industry Co., Ltd. Process for the production of a rare earth metal alkoxide. 4,507,245, Cl. 260-429.200.

Ozawa, Mikio: *See*—
Mori, Kenzo; and Ozawa, Mikio, 4,507,663, Cl. 343-440.000.

Ozawa, Tetsuo: *See*—
Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.

Ozil, Maurice; and Finger, Ulrich. Device for indicating the position of printed circuit cards relative to their connectors. 4,507,697, Cl. 361-1.000.

P.S. Paging System, A.B.: *See*—
Hamlin, Inge; and Beudat, Andre , 4,507,646, Cl. 340-310.00R.

Paccar Inc.: *See*—
Trexler, Ray W., Jr., 4,507,706, Cl. 361-331.000.

Pace, Gary M.; and Friedrich, James W., to Arcadian Corporation, Inc. Alpha-oximino alkanoic acid containing foliar fertilizers to increase yield of crop plants. 4,507,142, Cl. 71-83.000.

Pacific Industrial Co. Ltd.: *See*—
Yoshikawa, Seimi; Yamada, Hideo; and Okubo, Yoichi, 4,506,518, Cl. 62-180.000.

Pack, Hugo: *See*—
Ruch, Jean; Katryniok, Detlef; and Pack, Hugo, 4,507,367, Cl. 429-27.000.

Packaging Coordinators, Inc.: *See*—
Dlugosz, Jeffrey, 4,506,789, Cl. 206-532.000.

Paisley, Gary V.; and Malaspina, Alex, to Coca-Cola Company, The. Synthetic articles having a cork-like appearance. 4,507,405, Cl. 521-84.000.

Pako Corporation: *See*—
Baker, Richard W., 4,506,969, Cl. 354-298.000.

Palmieri, Anthony L. Eyeglass positioning apparatus. 4,506,961, Cl. 351-137.000.

Palvadeau, Claude; and Scheidt, Claude, to Societe Miniere et Metallurgique de Penarroya. Process for preparing metal by electrolysis, especially lead, and by-product obtained by their application. 4,507,182, Cl. 204-35.100.

Panduit Corp.: *See*—
Guzay, Casimir M., Jr., 4,506,430, Cl. 29-4[illegible].000.

Pandzik, Richard T., to General Motors Corporation. Air conditioning compressor unloading control system. 4,506,517, Cl. 62-175.000.

Panster, Peter; Michel, Rudolf; Kleinschmit, Peter; and Deschler, Ulrich, to Degussa Aktiengesellschaft. Process for the production of sulfur containing organosilicon compounds. 4,507,490, Cl. 556-427.000.

Paradis, Joseph R. Suction canister with corrugated adjustable suction inlet. 4,507,120, Cl. 604-320.000.

Paradis, Prudent R. Wood stove. 4,506,651, Cl. 126-4.000.

Pardini, Franco P., to General Electric Company. Current limiting circuit-breaker having an improved contact arrangement. 4,507,527, Cl. 200-145.000.

Pare, Girard F., to Donahue, Daniel J. Fire sprinkler. 4,506,737, Cl. 169-19.000.

Parfree, Colin S.; and Worthington, Peter, to International Standard Electric Corporation. Cable strain monitoring. 4,506,948, Cl. 350-96.230.

Park-Ohio Industries, Inc.: *See*—
Dewan, Shashi B.; and Adams, Graham R., 4,507,722, Cl. 363-79.000.

Parker, Andrew E. Device for opening ampoules. 4,506,817, Cl. 225-96.500.

Parker-Hannifin Corporation: *See*—
Viola, Frank J.; and Scaduto, Anthony, 4,506,418, Cl. 24-277.000.

Parker, Leon; and Campman, Arthur R., to Hitco. Three-dimensional thick fabrics and methods and apparatus for making same. 4,506,611, Cl. 112-79.00R.

Parker Pen Company, The: *See*—
Booker, Brian A. J., 4,506,426, Cl. 29-413.000.

Parks, Bennie L.: *See*—
Bennett, William T.; and Parks, Bennie L., 4,507,535, Cl. 219-121.0LL.

Parks-Cramer Company: *See*—
Lamb, Joseph T., 4,506,498, Cl. 57-87.000.

Parshall, George W.; and Tam, Wilson, to Du Pont de Nemours, E. I., and Company. Method for the hydrocarbylation of naphthoquinone derivatives. 4,507,241, Cl. 260-396.00R.

Pastorius, Walter J.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., 4,506,980, Cl. 356-237.000.

Patel, Natu: *See*—
Usher, Thomas C.; and Patel, Natu, 4,507,472, Cl. 536-51.000.

Patell, Mahesh K.: *See*—
Tencza, Thomas M.; and Patell, Mahesh K., 4,507,276, Cl. 424-37.000.

Patte, Philippe F.: *See*—
Houdard, Jean-Pierre; and Patte, Philippe F., 4,507,747, Cl. 364-724.000.

Paul, James L.: *See*—
Dougherty, Edward F.; Scates, Mark O.; and Paul, James L., 4,507,495, Cl. 560-205.000.

Paull, Jolanta: *See*—
Sujansky, Vladimir; Tribuzio, Sergio; and Paull, Jolanta, 4,507,161, Cl. 149-21.000.

Payne, Derick A.: *See*—
Dughan, Terence G.; Farmery, George M.; and Payne, Derick A., 4,506,813, Cl. 222-590.000.

Payne, George C., to Teknetics, Inc. Metal detector systems for identifying targets in mineralized ground. 4,507,612, Cl. 324-329.000.

Payne, Reginald K.; and Trett, John. Proximity detector circuitry especially for lift doors. 4,506,765, Cl. 187-29.00R.

Peck & Hale, Inc.: *See*—
Rosaia, Albert H., 4,507,032, Cl. 410-83.000.

Penick Corporation: *See*—
Petrocine, David V.; and Harmetz, Ronald, 4,507,518, Cl. 585-610.000.

Penn, William. Combined truck bed storage compartment and spoiler. 4,506,870, Cl. 296-1.00S.

Pennwalt Corporation: *See*—
Davidson, Thomas A.; and Murray, Robert J., 4,507,481, Cl. 546-121.000.

PeopLoungers, Inc.: *See*—
Griggs, Alvie, Jr., 4,506,926, Cl. 297-83.000.

Perepletchikov, Evgeny F.: *See*—
Bragin, Boris F.; Gladky, Petr V.; Markuntovich, Felix D.; Perepletchikov, Evgeny F.; Frumin, Isidor I.; and Ekber, Boris Y., 4,506,865, Cl. 251-366.000.

Perfetti, Bruno M., to United States Steel Corporation. Corrosion resistant core-plate and coatings therefor. 4,507,360, Cl. 428-336.000.

Perkin-Elmer Corporation, The: *See*—
Trost, David, 4,507,597, Cl. 318-653.000.

Perry, Mark E. Method of playing a game in which playing pieces are inverted. 4,506,893, Cl. 273-258.000.

Perry, Thomas J., to GTE Automatic Electric Incorporated. Digital span frame detection circuit. 4,507,780, Cl. 370-100.000.

Pescatore, Eugene A.: *See*—
Blechman, Abraham; and Pescatore, Eugene A., 4,507,084, Cl. 433-7.000.

Petersen, Carsten: *See*—
Griesenbrock, Karl-Heinz; David, Bernd; and Petersen, Carsten, 4,506,764, Cl. 187-9.00E.

Peting, Robert G., to Amsted Industries Incorporated. Restrained mechanical pipe joint. 4,506,919, Cl. 285-231.000.

Petrocine, David V.; and Harmetz, Ronald, to Penick Corporation. Dehydration of 2,5-dimethyl-2,5-hexanediol. 4,507,518, Cl. 585-610.000.

Petroleum Meter & Pump Co., Ind.: *See*—
McGee, Thomas G.; and Hockmuth, Richard L., 4,507,548, Cl. 235-94.00R.

Pfaffman, Jeffrey S.: *See*—
McCay, Johnny A.; Owens, Arthur H.; and Pfaffman, Jeffrey S., 4,506,575, Cl. 83-368.000.

Pfalzgraf, Manfred; and Probst, Kurt, to VDO Adolf Schindling AG. Electric gas pedal. 4,506,642, Cl. 123-361.000.

Pfeifer, Jack F.: *See*—
Aschinger, William T.; Pfeifer, Jack F.; and Shumaker, Dale E., 4,507,714, Cl. 362-126.000.

Pfizer Inc.: *See*—
Gymer, Geoffrey E.; and Richardson, Kenneth, 4,507,484, Cl. 546-210.000.

Phalen, Thomas E., Jr., to Roofblok Limited. Roof construction. 4,506,483, Cl. 52-408.000.

Philip Morris Incorporated: *See*—
Grollimund, Everett C., 4,506,952, Cl. 350-255.000.
Keritsis, Gus D., 4,506,684, Cl. 131-369.000.

Phillips Petroleum Company: *See*—
Boston, Ernest B., 4,507,398, Cl. 502-62.000.
Gentry, Cecil C., 4,506,728, Cl. 165-96.000.
Murtha, Timothy P., 4,507,507, Cl. 568-401.000.
Shioyama, Tod K., 4,507,506, Cl. 568-401.000.

Phong-Anant, Dheera, to Ihnativ, Lawrence Waldemar; and Squire, Alan Bruce. Process to produce hydrogen and oxygen utilizing the energy content of waste materials. 4,506,631, Cl. 122-2.000.

Piaget, Gary: *See*—
Alexander, Adam; and Piaget, Gary, 4,506,891, Cl. 273-153.00S.

Pieper, Werner; and Krause, Werner, to Hoechst Aktiengesellschaft. Process for making derivatives of vinylphosphonic acid or vinylpyrophosphonic acid. 4,507,249, Cl. 260-502.40R.

Pierre Fabre S.A.: *See*—
Cousse, Henri; Mouzin, Gilbert; Bonnaud, Bernard; Charveron, Marie; and Fauran, Francois, 4,507,318, Cl. 514-531.000.

Pierrel, Michel: *See*—
Bellocci, Rio; Gourmel, Yves; and Pierrel, Michel, 4,506,723, Cl. 164-421.000.

Piesch, Steffen: *See*—
Engelhardt, Friedrich; Piesch, Steffen; Balzer, Juliane; and Dawson, Jeffery C., 4,507,440, Cl. 525-218.000.

Pijl, Paul: *See*—
Van Deyck, Frans; Weiss, Franz-Josef; Verberckt, Roger; Thomas, Erwin; Mangelschots, Benedikt; and Pijl, Paul, 4,507,271, Cl. 423-387.000.

Pioneer Electronic Corporation: *See*—
Hosono, Toshio; Sakamoto, Masayoshi; and Ema, Shozo, 4,507,694, Cl. 360-90.000.
Ikedo, Yuji; Abe, Kunio; and Saito, Masatsugu, 4,507,768, Cl. 369-77.100.
Matsuda, Khoichi, 4,507,578, Cl. 307-520.000.

Pitney Bowes Inc.: *See*—
Clark, John I.; and Wologodzew, Leo, 4,507,104, Cl. 474-112.000.
McFiggans, Robert B.; and Muller, Arno, 4,507,744, Cl. 364-708.000.

Plies, Erich, to Siemens Aktiengesellschaft. Deflection structure for a corpuscular beam blanking system and method for operating same. 4,507,559, Cl. 250-396.00R.

Pliskin, William A.; Riseman, Jacob; and Shepard, Joseph F., to International Business Machines Corporation. Method for forming recessed isolated regions. 4,506,435, Cl. 29-576.00W.

Plummer, Ernest L., to FMC Corporation. Acaricidal 2,2'-bridged[1,1'-biphenyl]-3-ylmethyl esters. 4,507,317, Cl. 514-531.000.

Pneumo Corporation: *See*—
Vanderlaan, Robert D., 4,507,634, Cl. 335-272.000.

Poehler, Theodore O.: *See*—
Potember, Richard S.; Poehler, Theodore O.; and Cowan, Dwaine O., 4,507,672, Cl. 357-8.000.

Pohl, Stanley; Hnatchenko, Michael; and Feinland, Raymond, to Clairol Incorporated. Hair conditioning composition and method for use. 4,507,280, Cl. 424-70.000.

Pollhammer, Edgar: *See*—
Ritter, Gerhard; Ritter, Klaus; Ritter, Josef; and Pollhammer, Edgar, 4,506,818, Cl. 227-67.000.

Polska Akademia Nauk, Instytut Katalizy I Fizykochemii Powierzchni: *See*—
Wojciechowski, Jerzy; Haber, Jerzy; Gozdziewicz, Zygmunt; and Lange, Edward, 4,506,599, Cl. 99-469.000.

Polster, Louis S. Shortening management method and apparatus. 4,506,995, Cl. 374-57.000.

Polymer Projections, Inc.: *See*—
Freundlich, Richard A., 4,507,338, Cl. 428-35.000.

Polymer Science: *See*—
Stille, John K., 4,507,462, Cl. 528-125.000.

Ponn, Frederick H., III: *See*—
Lower, Loren D.; Marzocchi, Alfred; Ponn, Frederick H., III; and Roberts, Michael G., 4,507,365, Cl. 428-489.000.

Pont a Mousson S.A.: *See*—
Bellocci, Rio; Gourmel, Yves; and Pierrel, Michel, 4,506,723, Cl. 164-421.000.

Popsicle Industries, Inc.: *See*—
Armstrong, Robert G.; and Stewart, Richard L., 4,507,070, Cl. 425-126.00S.

Porter, Randall A.: *See*—
Reed, Larry E.; and Porter, Randall A., 4,507,196, Cl. 208-48.0AA.

Posner, Howard L. Method of manufacturing stick-on photographs. 4,507,166, Cl. 156-235.000.

Post, Martin F. M.: *See*—
Minderhoud, Johannes K.; and Post, Martin F. M., 4,507,404, Cl. 518-714.000.

Potember, Richard S.; Poehler, Theodore O.; and Cowan, Dwaine O., to Johns Hopkins University, The. Method of fabricating a current controlled bistable electrical organic thin film switching device. 4,507,672, Cl. 357-8.000.

Poth, Rainer, to Siemens Aktiengesellschaft. Driving mechanism for a three-position electrical switch. 4,507,641, Cl. 337-6.000.

Pott, Richard, to Aerotex Hochleistungsfaser GmbH. Method and apparatus for making a filamentary web. 4,507,164, Cl. 156-177.000.

Potter, E. L., to Textron, Inc. Chain saw automatic sharpening method and assembly. 4,506,565, Cl. 76-25.00A.

Potter, Terry A.; Nachtkamp, Klaus; and Weider, Franz, to Bayer Aktiengesellschaft. Process for production of polyisocyanates containing at least partly blocked isocyanate groups, compounds obtainable by this process and their use in production of polyurethanes, stoving lacquers or aqueous polyisocyanate solutions or dispersions. 4,507,427, Cl. 524-591.000.

Pougnet, Philippe, to Commissariat a l'Energie Atomique. Magnetic bubble propagation device. 4,507,754, Cl. 365-19.000.

Powers, Donald H., Jr., to Chomerics, Inc. Electromagnetic shielding. 4,507,359, Cl. 428-328.000.

Pozel S.A.: *See*—
Zellweger, Conrad; and Spreter, Victor, 4,506,654, Cl. 126-262.000.

PPG Industries, Inc.: *See*—
Gemert, Barry V., 4,507,147, Cl. 71-93.000.
Lavanish, Jerome M., 4,507,145, Cl. 71-092.000.
Tsai, Yih-Wan, 4,506,726, Cl. 165-1.000.

Pracht, Hans J.; and Obermeier, Thomas. Prefabricated panel for building wall construction and method of making same. 4,506,482, Cl. 52-235.000.

Prang, Robert: *See*—
Heims, Dirk; Ottermann, Hans-Gert; and Prang, Robert, 4,507,014, Cl. 404-102.000.

Pratt Burnerd International Limited: *See*—
Jackson, Joseph F.; and Waite, Ralph A., 4,506,896, Cl. 279-118.000.

Pratt, Jeremy D.: *See*—
Ashton, Michael J.; Cook, David C.; Daniels, Colin J.; Loveless, Anthony H.; Pratt, Jeremy D.; and Bull, Bernard T., 4,507,315, Cl. 514-396.000.

Preisig, Roland, to Bobst SA. Pile pressing device. 4,506,874, Cl. 271-35.000.

Printronix, Inc.: *See*—
Stumfall, David M., 4,507,796, Cl. 375-106.000.

Probst, Kurt: *See*—
Pfalzgraf, Manfred; and Probst, Kurt, 4,506,642, Cl. 123-361.000.

Procor Limited: *See*—
Mathur, Krishna S., 4,507,335, Cl. 427-215.000.

Procter, Brian J., to International Computers Limited. Data processing systems. 4,507,784, Cl. 371-61.000.

Proctor & Gamble Company, The: *See*—
Hughes, Larry J., 4,507,219, Cl. 252-118.000.
Johnson, Robert C.; and Burns, Larry E., 4,507,351, Cl. 428-198.000.

Progenics, Inc.: *See*—
Coleman, Douglas L.; and Applezweig, Norman, 4,507,289, Cl. 514-170.000.
Krsek, George, 4,507,242, Cl. 260-397.300.

Prono, Daniel S., to United States of America, Energy. Low pressure spark gap triggered by an ion diode. 4,507,589, Cl. 315-111.010.

Prono, Daniel S.; Caporaso, George J.; and Briggs, Richard J., to United States of America, Energy. Electrostatic wire for stabilizing a charged particle beam. 4,507,614, Cl. 328-233.000.

Prost, Roger: *See*—
Delacour, Pierre; and Prost, Roger, 4,506,512, Cl. 62-49.000.

Prottey, Colin: *See*—
Barratt, Martin D.; Bowser, Paul A.; Durrant, James A.; George, Dieno; Hall, Keith J.; Hill, John C.; Lowry, Michael R.; and Prottey, Colin, 4,507,319, Cl. 514-546.000.

Pruneau, Diane: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 4,506,846, Cl. 242-199.000.

Pryor, Timothy R.; Hageniers, Omer L.; Pastorius, Walter J.; Liptay-Wagner, Nicholas; and Clarke, Donald A., to Diffracto Ltd. Method and apparatus for determining physical characteristics of objects and object surfaces. 4,506,980, Cl. 356-237.000.

Pukel, Clifford S.; Lloyd, Kenneth O.; Travassos, Luiz R.; Dippold, Wolfgang G.; Oettgen, Herbert F.; and Old, Lloyd J., to Sloan-Kettering Institute for Cancer Research. Method for detecting the presence of G_{D3} ganglioside. 4,507,391, Cl. 436-504.000.

Puma-Sportschuhfabriken Rudolf Dassler KG: *See*—
Cavanagh, Peter R., 4,506,462, Cl. 36-92.000.

Puntener, Alois; and Beffa, Fabio, to Ciba-Geigy Corporation. 1:2 Metal complexes of azomethine dyes having arylazo groups. 4,507,124, Cl. 534-695.000.

Puntener, Alois; and Koller, Josef, to Ciba-Geigy Corporation. Use of 1:2 chrome complex dyes for dyeing leather and furs. 4,507,125, Cl. 8-437.000.

Pyro Technology Corp.: *See*—
George, Stephen; and George, Thomas H., 4,507,355, Cl. 428-246.000.

Q.P. Corporation: *See*—
Ueda, Tsunesuke, 4,507,327, Cl. 426-276.000.

Quantronix Corporation: *See*—
Daly, Richard T.; Cohen, Martin G.; and Kumar, Binod, 4,507,787, Cl. 372-62.000.
Daly, Richard T.; Rhoades, Walter; Stone, Harvey; and Kaplan, Robert A., 4,507,789, Cl. 372-92.000.

Quick-Rotan Elektromotoren GmbH: *See*—
Angersbach, Wolfgang; and Meier, Karl-Heinz, 4,507,596, Cl. 318-640.000.

Quin, Rene A.; Wiet, Paul; and Migliarese-Caputi, Jean-Louis, to Compagnie Francaise des Petroles. Automatic hydraulic connectors. 4,506,863, Cl. 251-149.900.

Quinn, Robert M.: *See*—
Bakeman, Paul E., Jr.; and Quinn, Robert M., 4,506,436, Cl. 29-577.00C.

Quiogue, Honesto D., to Harvey Hubbell Incorporated. Heat dissipator for plastic luminaire. 4,507,719, Cl. 362-404.000.

Raehse, Wilfried; Kuehne, Norbert; Wuest, Willi; and Engelskirchen, Konrad, to Henkel Kommanditgesellschaft. Process for highly substituted carboxyalkyl celluloses and mixed ethers thereof. 4,507,474, Cl. 536-97.000.

Ragnebring, Chris, to Akab of Sweden AB. Hemmer. 4,506,613, Cl. 112-143.000.

Rahdener Maschinenfabrik August Kolbus: *See*—
Rathert, Horst, 4,507,036, Cl. 412-9.000.

Raisfeld, Ilene H., to Research Foundation of State University of New York, The. Epithelial cell growth regulating composition containing polyamines and a method of using same. 4,507,321, Cl. 514-673.000.

Raj, Kuldip, to Ferrofluidics Corporation. Self-activating ferrofluid seal apparatus and method of use. 4,506,895, Cl. 277-1.000.

Raj Technology Partnership: *See*—
Sandhu, Jaswinder S., 4,506,550, Cl. 73-603.000.

Rajotte, Paul T.: *See*—
Morris, Robert A.; Kiesel, George W.; Rajotte, Paul T.; and Richards, Anthony L., 4,507,709, Cl. 361-400.000.

Ramirez, Justo D.: *See*—
Ramirez, Justo F.; and Ramirez, Justo D., 4,506,601, Cl. 99-511.000.

Ramirez, Justo F.; and Ramirez, Justo D. Juice extractor with automatic pulp discharge. 4,506,601, Cl. 99-511.000.

Ramot University Authority For Applied Research And Industrial Development, Ltd.: *See*—
Aloni, Roni, 4,507,144, Cl. 71-89.000.

Ranade, Gautam R.; and Salee, Gideon, to Occidental Chemical Corporation. Blends of vinyl halide-polyolefin graft polymers and polycarbonate polymers. 4,507,434, Cl. 525-67.000.

Rand, Burt E. Staple supply indicator. 4,506,819, Cl. 227-120.000.

Rapp, Fred: *See*—
Asculai, Samuel S.; and Rapp, Fred, 4,507,281, Cl. 424-85.000.

Rasshofer, Werner, to Bayer Aktiengesellschaft. Polyisocyanates prepared by phosgenating a polyamine in the presence of a compound containing at least one hydroxyl group. 4,507,464, Cl. 528-288.000.

Rathbun, Ethan M., to William A. Dye, a part interest. Harness apparatus and method for breathing exercises. 4,506,883, Cl. 272-99.000.

Rathert, Horst, to Rahdener Maschinenfabrik August Kolbus. Inner book clamp. 4,507,036, Cl. 412-9.000.

Raussendorf, Gerhard: *See*—
Raussendorf, Horst; and Raussendorf, Gerhard, 4,506,920, Cl. 289-8.000.

Raussendorf, Horst; and Raussendorf, Gerhard, to Veb Kombinat Fortschritt Landmaschinen. Knotter for baling machine. 4,506,920, Cl. 289-8.000.

Ray, David J., to Becton Dickinson and Company. Transducer selecting system. 4,506,551, Cl. 73-660.000.

Raychem Corporation: *See*—
Rinde, James A.; Lopez, Eugene F.; and Glover, Leon C., 4,507,340, Cl. 428-36.000.

Raynes, Edward P.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; Thompson, David J.; and Newton, David F., 4,506,957, Cl. 350-349.000.

Raytheon Company: *See*—
Barnie, James W.; and Rudko, Robert I., 4,507,788, Cl. 372-83.000.
Morrison, Brian D., 4,507,731, Cl. 364-200.000.
Teich, Wesley W.; and Adamski, Joseph R., 4,507,531, Cl. 219-10.55B.

RCA Corporation: *See*—
Battson, Donald F., 4,507,684, Cl. 358-213.000.
Bendell, Sidney L., 4,507,679, Cl. 358-55.000.

Christopher, Lauren A.; and Sprague, David L., 4,507,725, Cl. 364-724.000.
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,507,649, Cl. 340-347.0AD.
Dischert, Robert A.; and Williams, James J., Jr., 4,507,676, Cl. 358-30.000.
Goodman, Alvin M., 4,507,334, Cl. 427-93.000.
Kelleher, Kevin C., 4,507,591, Cl. 318-254.000.
Knop, Karl H., 4,506,949, Cl. 350-162.190.
McCann, James T.; Dobbins, Lawrence W.; and Reno, Charles W., 4,507,773, Cl. 369-110.000.
Recker, Richard D.: *See*—
Garcia, George L.; Recker, Richard D.; and Tisbo, Thomas A., 4,506,698, Cl. 137-355.260.
Recordati S.A.: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, 4,507,308, Cl. 514-313.000.
Redicon Corporation: *See*—
Doyle, Stephen D.; and Bulso, Joseph D., Jr., 4,506,534, Cl. 72-345.000.
Reed, Claude A. Comestible converting apparatus. 4,506,988, Cl. 366-203.000.
Reed, Larry E.; and Porter, Randall A. Antifoulants for thermal cracking processes. 4,507,196, Cl. 208-48.0AA.
Reed, Robert L., to Standard Oil Company (Indiana). Process for producing and recovering elemental sulfur from acid gas. 4,507,275, Cl. 423-574.00R.
Regel, Erik; Buchel, Karl H.; Lurssen, Klaus; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Triazolylalkyl-thioether plant growth regulators and fungicides. 4,507,141, Cl. 71-76.000.
Regli, Johann: *See*—
Somlo, Tibor; and Regli, Johann, 4,507,240, Cl. 260-384.000.
Reh, Carter K. Vortex mixer. 4,506,989, Cl. 366-270.000.
Reiff, Friedrich; Hartner, Hartmut; Basedow, Arno; Hugenbusch, Hans-Wolfgang; Schmidt, Peter C.; and Bardonner, Hans, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Sorbitol, process for its preparation, and use thereof. 4,507,511, Cl. 568-852.000.
Reilly, Laurence W., Jr., to Minnesota Mining and Manufacturing Company. Water soluble michlers ketone analogs. 4,507,497, Cl. 562-441.000.
Reimers, Ulrich, to Robert Bosch GmbH. Method of improving the resolution of the semiconductor sensor type of television camera. 4,507,677, Cl. 358-50.000.
Reinhold, William R., to Rotorque Associates. Rotary internal combustion engine. 4,506,637, Cl. 123-246.000.
Reiter, Steven: *See*—
Schurman, Richard H.; Schurman, John W.; Clark, Richard W.; and Reiter, Steven, 4,506,626, Cl. 118-665.000.
Reliability, Inc.: *See*—
Jones, Daniel P., 4,507,544, Cl. 219-209.000.
Renaux, Charley: *See*—
Aubert, Michel; and Renaux, Charley, 4,507,261, Cl. 376-270.000.
Reno, Charles W.: *See*—
McCann, James T.; Dobbins, Lawrence W.; and Reno, Charles W., 4,507,773, Cl. 369-110.000.
Research Corporation: *See*—
Tam, James P.; Heath, William F., Jr.; and Merrifield, Robert B., 4,507,230, Cl. 260-112.50R.
Research Foundation of State University of New York, The: *See*—
Raisfeld, Ilene H., 4,507,321, Cl. 514-673.000.
Revere Corporation of America: *See*—
Jacobson, Walter E.; and Cibelli, Anthony H., 4,506,557, Cl. 73-862.650.
Rheinmetall GmbH.: *See*—
Flach, Jurgen, deceased; Opitz, Rigobert; Daugart, Heinz; and Baden, Hans-Gunter, 4,507,608, Cl. 324-220.000.
Rheodyne Incorporated: *See*—
Bakalyar, Stephen R., 4,506,558, Cl. 73-863.720.
Rhoades, Walter: *See*—
Daly, Richard T.; Rhoades, Walter; Stone, Harvey; and Kaplan, Robert A., 4,507,789, Cl. 372-92.000.
Rich, Edward L., III; and Yalim, Yucel Y., to Westinghouse Electric Co. High frequency transformer. 4,507,640, Cl. 336-223.000.
Rich, Michael; and Ek, F. Donald, to Tenax Corporation. Lockable pegboard hook construction. 4,506,856, Cl. 248-222.100.
Richards, Anthony L.: *See*—
Morris, Robert A.; Kiesel, George W.; Rajotte, Paul T.; and Richards, Anthony L., 4,507,709, Cl. 361-400.000.
Richards, James, to Commonwealth of Australia, The. Unpolarized electro-optically Q-switched laser. 4,507,785, Cl. 372-12.000.
Richardson, Kenneth: *See*—
Gymer, Geoffrey E.; and Richardson, Kenneth, 4,507,484, Cl. 346-210.000.
Ricoh Company, Ltd.: *See*—
Kitajima, Tomoya; and Araki, Kunihiko, 4,506,965, Cl. 354-173.100.
Motosugi, Takanori; Sakai, Hisashi; and Iiyama, Kiyotaka, 4,507,670, Cl. 346-208.000.
Ohta, Masafumi, 4,507,471, Cl. 534-755.000.
Sakamoto, Hiroshi; Koseki, Yoshihiro; Motosugi, Takanori; and Inaba, Norihiko, 4,507,669, Cl. 346-207.000.
Riead, John T., to Rieadco Corporation. Line attachment for fishing float. 4,506,471, Cl. 43-44.870.
Rieadco Corporation: *See*—
Riead, John T., 4,506,471, Cl. 43-44.870.
Riedel, Jack: *See*—
Blosser, Henry G.; Johnson, David A.; Riedel, Jack; and Burleigh, Richard J., 4,507,616, Cl. 328-234.000.
Rieger, Ewald: *See*—
Wiedemann, Fritz; and Rieger, Ewald, 4,507,488, Cl. 548-362.000.
Rieter Machine Works, Ltd.: *See*—
Novak, Peter; and Moertl, Willi, 4,506,780, Cl. 198-483.000.
Schlegel, Andy; and Busenhart, Peter, 4,506,692, Cl. 137-102.000.
Riker Laboratories, Inc.: *See*—
Wade, James J., 4,507,477, Cl. 544-250.000.
Rinde, James A.; Lopez, Eugene F.; and Glover, Leon C., to Raychem Corporation. Adhesives and devices coated therewith. 4,507,340, Cl. 428-36.000.
Riniker, Hans; and Killer, Walter, to Walter Killer. Comminution and mixing apparatus. 4,506,838, Cl. 241-98.000.
Rinke, Bernard: *See*—
Valentine, Al L.; Rinke, Bernard; and Wenzel, Chester M., 4,507,045, Cl. 414-753.000.
Riordan, James F. Soldering iron with solder dispensing device. 4,507,545, Cl. 219-230.000.
Riseman, Jacob: *See*—
Bhatia, Harsaran S.; Bhatia, Satyapal S.; Riseman, Jacob; and Valsamakis, Emmanuel A., 4,507,171, Cl. 156-643.000.
Pliskin, William A.; Riseman, Jacob; and Shepard, Joseph F., 4,506,435, Cl. 29-576.00W.
Ritchie Family Company, The: *See*—
Ritchie, William B., Jr.; and Ritchie, Marguerite M., 4,506,396, Cl. 5-431.000.
Ritchie, Marguerite M.: *See*—
Ritchie, William B., Jr.; and Ritchie, Marguerite M., 4,506,396, Cl. 5-431.000.
Ritchie, William B., Jr.; and Ritchie, Marguerite M., to Ritchie Family Company, The. Comfort pillow for pregnant females. 4,506,396, Cl. 5-431.000.
Ritter, Gerhard; Ritter, Klaus; Ritter, Josef; and Pollhammer, Edgar, to EVG Entwicklungs- und Verwertungs-Gesellschaft m.b.H. Device for the purpose of pushing sections of a wire through a solid body consisting of yielding material. 4,506,818, Cl. 227-67.000.
Ritter, Josef: *See*—
Ritter, Gerhard; Ritter, Klaus; Ritter, Josef; and Pollhammer, Edgar, 4,506,818, Cl. 227-67.000.
Ritter, Klaus: *See*—
Ritter, Gerhard; Ritter, Klaus; Ritter, Josef; and Pollhammer, Edgar, 4,506,818, Cl. 227-67.000.
Rittler, Hermann L., to Corning Glass Works. Transparent glass-ceramics of high negative expansion for use as decorative glazes. 4,507,392, Cl. 501-4.000.
Roach, Peter F.; Caldwell-Nichols, Christopher J.; and Thomson, Alexander, to United Kingdom Atomic Energy Authority. Apparatus for the measurement of the movement of a member horizontally relative to a datum. 4,507,603, Cl. 324-61.00P.
Roake, Joseph C., to Barry Wright Corporation. Apparatus for securing an electronic unit to an avionics tray. 4,506,439, Cl. 29-747.000.
Roba, Joseph L.: *See*—
Niebes, Paul J.; Matagne, Daniel M.; Hanon, Etienne P.; Roba, Joseph L.; and Lambelin, Georges E., 4,507,314, Cl. 514-456.000.
Robert Bosch GmbH: *See*—
Armbruster, Gerhard; Neubert, Werner; and Schaal, Gunter, 4,506,711, Cl. 144-230.000.
Britsch, Heinz, 4,506,633, Cl. 123-59.0EC.
Kemmner, Ulrich; and Kleppner, Stephan, 4,507,063, Cl. 417-540.000.
Reimers, Ulrich, 4,507,677, Cl. 358-50.000.
Roberts, Graham S.; Smith, David T.; and Woolsey, Brian J. Modular wall and ceiling system. 4,506,595, Cl. 98-31.000.
Roberts, Michael G.: *See*—
Lower, Loren D.; Marzocchi, Alfred; Ponn, Frederick H., III; and Roberts, Michael G., 4,507,365, Cl. 428-489.000.
Roberts, Richard W., to Borg-Warner Corporation. Controlled displacement supercharger. 4,506,648, Cl. 123-564.000.
Robertson, John A., to Telesis Controls Corporation. Program controlled pin matrix embossing apparatus. 4,506,999, Cl. 400-121.000.
Robinson, Frank; and Betts, Max W., to Courtaulds PLC. Knitting machine. 4,506,525, Cl. 66-109.000.
Robinson, Martin A.: *See*—
Soriano, David S.; Demmin, Timothy R.; and Robinson, Martin A., 4,507,251, Cl. 260-944.000.
Robinson, Melvin L.: *See*—
Johnson, Terry D., 4,506,465, Cl. 37-268.000.
Robinson, William K.; and White, Malcolm J., to Chubb & Son's Lock and Safe Company Limited. Key-operated lock. 4,506,530, Cl. 70-338.000.
Roccaforte, Harry I., to Champion International Corporation. Serrated cutting edge for sheet material dispenser and method of forming the same. 4,506,816, Cl. 225-48.000.
Rockwell International Corporation: *See*—
Godejahn, Gordon C., Jr., 4,506,437, Cl. 29-577.00C.
Morey, William A.; and Tonneson, Ronald J., 4,507,656, Cl. 340-739.000.
Sheem, Sang K., 4,507,775, Cl. 370-4.000.
White, Stanley A., 4,507,741, Cl. 364-554.000.
Rodman, Fred K. Chaps. 4,506,391, Cl. 2-227.000.
Roehrig, Frederick K., to Owens-Corning Fiberglas Corporation. Creep resistant dispersion strengthened metals. 4,507,156, Cl. 148-11.50P.

Roesner, Raymond E.; and Sloan, Mark L., to Dresser Industries, Inc. Method and apparatus for determining flow characteristics within a well. 4,507,552, Cl. 250-259.000.

Rogers, Philip L., to Lockheed Corporation. Compact radiation fringe velocimeter for measuring in three dimensions. 4,506,979, Cl. 356-28.500.

Rohm, Ernst, to Messer Griesheim GmbH. Protective device for the welding circuit of welding power sources. 4,507,699, Cl. 361-50.000.

Rohm and Haas Company: *See*—
Hutton, Thomas W.; and Lavelle, Joseph A., 4,507,454, Cl. 526-317.000.
Kielbania, Andrew J., Jr., 4,507,342, Cl. 428-90.000.
Smolanoff, Joel R., 4,507,291, Cl. 514-278.000.

Roller Corporation of America: *See*—
Monett, Edward, 4,507,035, Cl. 411-377.000.

Romagnoli, Andrea, to IMA-Industria Macchine Automatiche S.p.A. Machine for producing blister packages. 4,506,495, Cl. 53-559.000.

Rommel, Reiner. Wiring tool for wiring electric multi-pin plug-in connectors, connector strips or the like using clamp-cutting techniques. 4,506,440, Cl. 29-751.000.

Ron, Moshe. Method for preparing improved porous metal-hydride compacts. 4,507,263, Cl. 419-48.000.

Roofblok Limited: *See*—
Phalen, Thomas E., Jr., 4,506,483, Cl. 52-408.000.

Root, Joseph J.: *See*—
Asmussen, Jes; and Root, Joseph J., 4,507,588, Cl. 315-39.000.

Roper, Brett E.; and Herrera, Juan M., to Oilfield Industrial Lines, Inc. Non-rigid buoyant marine storage vessels for fluids. 4,506,623, Cl. 114-256.000.

Rorer Group Inc.: *See*—
Bonnell, Leonard J., 4,506,673, Cl. 128-419.00F.

Rorer Italiana, S.P.A.: *See*—
Vellini, Massimiliano, 4,507,286, Cl. 514-23.000.

Rosaia, Albert H., to Peck & Hale, Inc. Retractable twistlock for securement of a container to a support. 4,507,032, Cl. 410-83.000.

Rosch, Hubert J., III, to Circuit Services Corporation. Printed circuit processing apparatus. 4,506,687, Cl. 134-83.000.

Rose, John A.; and Dyer, Keith, to AMF Inc. Method of manufacture of jigs. 4,507,029, Cl. 409-114.000.

Rose, Walter D., to Chandler Engineering Company. Apparatus and procedure for relative permeability measurements. 4,506,542, Cl. 73-38.000.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Phenols and use thereof as stabilizers. 4,507,420, Cl. 524-331.000.

Ross, Leonard C.: *See*—
Gaines, Harold S.; and Ross, Leonard C., 4,506,578, Cl. 83-583.000.

Rossetti, Nazzareno: *See*—
Siligoni, Marco; and Rossetti, Nazzareno, 4,507,525, Cl. 179-81.00R.

Rossetti, Vittorio; Dondoni, Alessandro; and Fantin, Giancarlo, to Francis S.p A. N-(4-Hydroxybenzyl)-3,4,5-trimethoxybenzamide and method for producing trimethobenzamide chlorohydrate. 4,507,499, Cl. 564-179.000.

Rossi, Gianrico, to Edwards Alto Vuoto S.p.A. Loading equipment for lyophilization apparatus. 4,506,455, Cl. 34-5.000.

Rossignol, Jean F., to Smithkline Beckman Corporation. β-Glycerophosphate salts of antimalarial phenanthrenemethanol compounds. 4,507,288, Cl. 514-143.000.

Rossum, David P., to E-MU Systems, Inc. Electronic musical instrument. 4,506,579, Cl. 84-1.010.

Roth, Alfred H., to General Electric Environmental Services, Inc. Staggered method cleaning cycle for fabric filter system including multiple-baghouses. 4,507,130, Cl. 55-96.000.

Rothenberg, Carl; Stangel, John J.; and Valentino, Pasquale A., to Sperry Corporation. Optically coupled, array antenna. 4,507,662, Cl. 343-376.000.

Rotorque Associates: *See*—
Reinhold, William R., 4,506,637, Cl. 123-246.000.

Rousseau, Alan D.; Fohrenkamm, Elsie A.; and Kausch, William L., to Minnesota Mining and Manufacturing Company. Water developable positive acting lithographic printing plate. 4,507,382, Cl. 430-275.000.

Rousseau, Thierry: *See*—
Bedu, Marcel; and Rousseau, Thierry, 4,507,606, Cl. 324-158.00R.

Roussel, Philippe, to LASAG AG. Contact lens for observation or irradiation of the eye. 4,506,962, Cl. 351-160.00R.

Rowland, Charles M.; and Denneny, James A., Jr., to Garrett Corporation, The. Fluid flow control apparatus and method. 4,506,594, Cl. 98-1.500.

Rowlette, John R., to California Institute of Technology. Positive battery plate. 4,507,372, Cl. 429-228.000.

Roza, Engel: *See*—
Dijkstra, Jan; and Roza, Engel, 4,507,619, Cl. 330-297.000.

Rozsa, Kalman, to Facit Aktiebolag. Device for correcting of backlash in drive mechanisms comprising a screw and a nut. 4,507,595, Cl. 318-630.000.

Ruch, Jean; Katryniok, Detlef; and Pack, Hugo, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Galvanic element, particularly a metal-air cell. 4,507,367, Cl. 429-27.000.

Rudko, Robert I.: *See*—
Barnie, James W.; and Rudko, Robert I., 4,507,788, Cl. 372-83.000.

Rudy, Marion F. Spring moderator for articles of footwear. 4,506,460, Cl. 36-28.000.

Ruff, James H.: *See*—
Hewlitt, Robert W.; Ruff, James H.; and Haight, Aubrey E., 4,506,645, Cl. 123-470.000.

Russell, Donald J.; and Sanders, Michael A., to Healthdyne, Inc. Patient monitor for providing respiration and electrocardiogram signals. 4,506,678, Cl. 128-723.000.

Rutledge, Raleigh N.: *See*—
Hahn, Granville J.; Rutledge, Raleigh N.; and Murley, Jackie D., 4,507,071, Cl. 425-133.100.

Ryan, Clara G.: *See*—
Vining, Herbert C.; and Ryan, Clara G., 4,507,117, Cl. 604-196.000.

Ryan, Clarke S.: *See*—
Austin, Stewart S.; Baldini, Joseph J., III; Jakubson, Joel E.; and Ryan, Clarke S., 4,507,783, Cl. 371-49.000.

Ryason, P. R.: *See*—
Devries, Louis; and Ryason, P. R., 4,507,517, Cl. 585-415.000.

Rylicki, Edward J.: *See*—
Fathauer, George H.; Fowler, James M., Jr.; Rylicki, Edward J.; and Mason, Edwin E., 4,507,131, Cl. 55-104.000.

S. A. Martin: *See*—
Capdebosco, Bernard; and Mion, Jean-Luc, 4,506,875, Cl. 271-99.000.

S.N.E.C.M.A.: *See*—
Lesgourgues, Jacques; and Tirole, Jacques P. H., 4,507,051, Cl. 416-97.00R.

S. S. Steiner, Inc.: *See*—
Grant, Herbert L., 4,507,329, Cl. 426-600.000.

Sabia, Raffaele A.: *See*—
Chapin, John T.; and Sabia, Raffaele A., 4,507,362, Cl. 428-383.000.

Safe-T-Plug, Inc.: *See*—
Colbrese, Nick P., 4,507,720, Cl. 363-13.000.

Sagara, Shigetoshi: *See*—
Fukumitsu, Akira; and Sagara, Shigetoshi, 4,507,769, Cl. 369-77.200.

Sagiv, Oded. to Savin Corporation. Automatic biasing mechanism for paper cassette support plate. 4,506,877, Cl. 271-127.000.

Saigo, Hideaki: *See*—
Utsunomiya, Tadashi; Matsumuro, Yasuhiko; and Saigo, Hideaki, 4,507,418, Cl. 524-318.000.

Saimi, Tetsuo; and Yoshizumi, Keiichi, to Matsushita Electric Industrial Co., Ltd. Optical device for optically recording and reproducing information signals on an information carrier. 4,507,766, Cl. 369-45.000.

St. Georgiev, Vassil: *See*—
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,507,300, Cl. 514-280.000.

St. Regis Paper Company: *See*—
Brenholdt, Irving R., 4,507,556, Cl. 250-341.000.
Steltenkamp, Michael S., 4,507,172, Cl. 162-30.110.

Saito, Hiraku; Suzuki, Yasuo; Fujii, Katsumi; Miyazaki, Kaoru; and Horio, Takekazu, to Oriental Yeast Co., Ltd. Colored molecular weight marker. 4,507,233, Cl. 260-115.000.

Saito, Masahiko: *See*—
Kato, Yoshinori; Umemoto, Naoji; Saito, Masahiko; and Hara, Takeshi, 4,507,234, Cl. 260-121.000.

Saito, Masatsugu: *See*—
Ikedo, Yuji; Abe, Kunio; and Saito, Masatsugu, 4,507,768, Cl. 369-77.100.

Saito, Takayuki: *See*—
Kikuchi, Toru; Saito, Takayuki; Kobayashi, Akihiro; and Goto, Hitoshi, 4,507,460, Cl. 525-507.000.

Saito, Toru: *See*—
Horiuchi, Susumu; Hiraoka, Taiji; and Saito, Toru, 4,507,390, Cl. 436-161.000.

Saitoh, Mikio: *See*—
Kuriyama, Shizuo; and Saitoh, Mikio, 4,507,322, Cl. 514-648.000.

Sakai, Hisashi: *See*—
Motosugi, Takanori; Sakai, Hisashi; and Iiyama, Kiyotaka, 4,507,670, Cl. 346-208.000.

Sakaji, Richard H.: *See*—
Daughton, Christian G.; and Sakaji, Richard H., 4,506,987, Cl. 366-160.000.

Sakakibara, Tatsuo: *See*—
Ban, Keisuke; Arai, Takeo; Sakakibara, Tatsuo; and Miyake, Noriaki, 4,506,721, Cl. 164-97.000.

Sakamoto, Hiroshi; Koseki, Yoshihiro; Motosugi, Takanori; and Inaba, Norihiko, to Ricoh Company, Ltd. Thermosensitive recording sheet. 4,507,669, Cl. 346-207.000.

Sakamoto, Kazushi; Okamoto, Tetsuro; and Okutani, Shigeaki, to Fujitsu Limited. Data processing system for parallel processing of different instructions. 4,507,728, Cl. 364-200.000.

Sakamoto, Masayoshi: *See*—
Hosono, Toshio; Sakamoto, Masayoshi; and Ema, Shozo, 4,507,694, Cl. 360-90.000.

Sakaue, Shiyuki: *See*—
Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, 4,507,046, Cl. 414-735.000.

Sakurada, Kazuyuki; Funyu, Yutaka; Togashi, Fusao; Kanno, Toyoji; and Masuda, Toshikazu. Control method and apparatus for screwing down reeling rolls. 4,506,531, Cl. 72-8.000.

Salas, Edward R.: *See*—
Johnson, Robert B.; Nibby, Chester M., Jr.; and Salas, Edward R., 4,507,730, Cl. 364-200.000.

Salee, Gideon: *See*—
Ranade, Gautam R.; and Salee, Gideon, 4,507,434, Cl. 525-67.000.

Salmeen, Lorraine J., personal representative: *See*—
Klowak, Bernard G.; and Salmeen, Nilo I., Jr., deceased, 4,507,173, Cl. 162-112.000.

Salmeen, Nilo I., Jr., deceased: *See*—
Klowak, Bernard G.; and Salmeen, Nilo I., Jr., deceased, 4,507,173, Cl. 162-112.000.

Samson Ocean Systems, Inc.: *See*—
Linehan, Joseph J.; and Amato, Phillip S., 4,506,622, Cl. 114-230.000.

Sanders, Michael A.: *See*—
Russell, Donald J.; and Sanders, Michael A., 4,506,678, Cl. 128-723.000.

Sandhu, Jaswinder S., to Raj Technology Partnership. Non-destructive testing system employing a liquid crystal detector cell. 4,506,550, Cl. 73-603.000.

Sandmann, Dennis E. Expansion bulb for plugging a conduit or passage. 4,506,706, Cl. 138-93.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,507,539, Cl. 219-121.0PY.

Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, to Sando Iron Works Co., Ltd. Method for continuous treatment of a cloth with the use of low-temperature plasma and an apparatus therefor. 4,507,539, Cl. 219-121.0PY.

Sandoz Ltd.: *See*—
Devoise-Lambert, Andre ; and Gisi, Ulrich, 4,507,310, Cl. 514-376.000.

Sands, Robert E.: *See*—
Daghe, Joseph L.; and Sands, Robert E., 4,506,694, Cl. 137-218.000.

Sanford, Robert A.: *See*—
Cantrell, Daniel V.; and Sanford, Robert A., 4,506,683, Cl. 131-336.000.

Sankyo Rikagaku Kabushiki Kaisha: *See*—
Tsuruta, Hirobumi; and Kondo, Kiichi, 4,507,383, Cl. 430-275.000.

Sano, Shoichi; and Furukawa, Yoshimi, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular steering system. 4,506,899, Cl. 280-91.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Hidetaka; and Kinpara, Akiyoshi, 4,507,090, Cl. 440-52.000.

Santrade Ltd.: *See*—
Sundstrom, Erik W., 4,506,444, Cl. 30-122.000.

Sanyo Electric Co., Ltd.: *See*—
Hashimoto, Hisashi, 4,507,368, Cl. 429-62.000.

Sapper, John M. Dripless candle. 4,507,077, Cl. 431-228.000.

Sasaki, Hideharu: *See*—
Shimada, Keizo; Sasaki, Hideharu; Mera, Hiroshi; Sawaki, Toru; and Aoki, Akihiro, 4,507,467, Cl. 528-348.000.

Sasaki, Isao; Ii, Yasuaki; and Mori, Hiroshi, to Mitsubishi Rayon Co., Ltd. Modified polyolefin composite material with improved properties. 4,507,423, Cl. 524-427.000.

Sasaki, Shin, to Sony Corporation. Tape cassette. 4,507,692, Cl. 360-60.000.

Sasaki, Susumu, to Fujitsu Limited. Carrier recovery circuit for a PSK modulated signal. 4,507,617, Cl. 329-50.000.

Sasaki, Tsuneo: *See*—
Minami, Masana; Tamaki, Hiroshi; Sasaki, Tsuneo; and Kimura, Kazuaki, 4,507,647, Cl. 340-347.00P.

Sato, Hiroshi; Yabu, Shuichi; and Kosugi, Masao, to Canon Kabushiki Kaisha. Transfer apparatus provided with an auto-focusing mechanism. 4,506,977, Cl. 355-53.000.

Sato, Koichiro: *See*—
Horiya, Keiichi; Shiozaki, Tsugio; and Sato, Koichiro, 4,507,668, Cl. 346-76.0PH.

Sato, Kozo: *See*—
Naito, Hideki; Hara, Hiroshi; Sato, Kozo; and Yabuki, Yoshiharu, 4,507,380, Cl. 430-203.000.

Sato, Mikio: *See*—
Imazeki, Shuji; Mukoo, Akio; Sato, Mikio; Kaneko, Masaharu; Ozawa, Tetsuo; and Yoneyama, Tomio, 4,507,221, Cl. 252-299.100.

Sato, Mitsuyoshi: *See*—
Shibata, Katsuhiko; and Sato, Mitsuyoshi, 4,507,352, Cl. 428-201.000.

Satoh, Kenji: *See*—
Azuma, Nobuo; Satoh, Kenji; Mohri, Katsuo; and Furuhata, Takashi, 4,507,690, Cl. 360-33.100.

Satoh, Saburoh; Gotoh, Tatumi; Horii, Kenji; and Akiyama, Hidenori, to Tokyo Shibaura Denki Kabushiki Kaisha. Glow discharge generating apparatus. 4,507,266, Cl. 422-186.150.

Sattelmeyer, Richard: *See*—
Hesse, Wolfgang; Sattelmeyer, Richard; and Schunck, Erich, 4,507,419, Cl. 524-327.000.

Saunders, Frances C.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; Thompson, David J.; and Newton, David F., 4,506,957, Cl. 350-349.000.

Saunders, Peter R.: *See*—
Twilley, Ian C.; Turner, Garland L.; Saunders, Peter R.; and Haylock, John C., 4,507,361, Cl. 428-373.000.

Savage, Donald S.: *See*—
Clarke, Ronald L. C.; and Savage, Donald S., 4,506,536, Cl. 72-391.000.

Savin Corporation: *See*—
Sagiv, Oded, 4,506,877, Cl. 271-127.000.

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Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Sawada, Yasuhiro: *See*—
Higo, Tsutomu; Mizutani, Shoji; Sawada, Yasuhiro; and Kengaku, Katsumi, 4,507,265, Cl. 422-186.000.

Sawada, Yutaka: *See*—
Taga, Yasunori; and Sawada, Yutaka, 4,507,547, Cl. 219-543.000.

Sawaki, Toru: *See*—
Shimada, Keizo; Sasaki, Hideharu; Mera, Hiroshi; Sawaki, Toru; and Aoki, Akihiro, 4,507,467, Cl. 528-348.000.

Sawvel, Thomas D. Revel-ice cream container filling device. 4,506,710, Cl. 141-100.000.

Scaduto, Anthony: *See*—
Viola, Frank J.; and Scaduto, Anthony, 4,506,418, Cl. 24-277.000.

Scates, Mark O.: *See*—
Dougherty, Edward F.; Scates, Mark O.; and Paul, James L., 4,507,495, Cl. 560-205.000.

SCC Six-In-One Containers Co., S.A.: *See*—
Goutille, Maurice, 4,506,798, Cl. 220-1.500.

Schaaf, Theodore F., to AT&T Technologies, Inc. Plating method using expandable masking bed. 4,507,330, Cl. 427-261.000.

Schaake, Herbert F.: *See*—
Beck, Jeffrey D.; Schaake, Herbert F.; Tregilgas, John H.; and Kinch, Michael A., 4,507,160, Cl. 148-191.000.

Schaal, Gunter: *See*—
Armbruster, Gerhard; Neubert, Werner; and Schaal, Gunter, 4,506,711, Cl. 144-230.000.

Schafer, David E.; and Czajkowski, Albert J., to Monsanto Company. Organothiophosphorous compounds useful as antidotes for thiocarbamate herbicides. 4,507,143, Cl. 71-87.000.

Schapiro, Abraham, deceased; and Schapiro, Mable S., executor. Instantized mixture of soya protein and caseinate. 4,507,328, Cl. 426-580.000.

Schapiro, Mable S., executor: *See*—
Schapiro, Abraham, deceased; and Schapiro, Mable S., executor, 4,507,328, Cl. 426-580.000.

Schaus, John M.: *See*—
Nichols, Cynthia L.; Kornfeld, Edmund C.; and Schaus, John M., 4,507,478, Cl. 544-250.000.

Scheidt, Claude: *See*—
Palvadeau, Claude; and Scheidt, Claude, 4,507,182, Cl. 204-35.100.

Scheltema, Otto E.: *See*—
Verhoeven, Leonardus A. J.; Scheltema, Otto E.; and Carels, Walter E., 4,507,681, Cl. 358-111.000.

Schering Aktiengesellschaft: *See*—
Junghans, Klaus, 4,507,238, Cl. 260-239.570.

Schering Corp.: *See*—
Bristol, James A.; and Lovey, Raymond G., 4,507,294, Cl. 514-249.000.

Schermers, Franciscus: *See*—
LaSarge, Eugene A.; Schermers, Franciscus; and Sugarbaker, Daniel L., 4,507,737, Cl. 364-453.000.

Schetina, Otto: *See*—
Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,506,932, Cl. 299-1.000.

Schieser, Warren J.; Vickers, Stanley E.; and Duffey, Craig L., to Liqui-Box Corporation. Filler and capper for containers. 4,506,489, Cl. 53-64.000.

Schlage Lock Company: *See*—
Downey, William L., 4,506,407, Cl. 16-48.500.

Schlegel, Andy; and Busenhart, Peter, to Rieter Machine Works, Ltd. Device for feeding a pressure medium into a shaft. 4,506,692, Cl. 137-102.000.

Schleihauf, Gerhard: *See*—
Kuhlmann, Gerhard; Schleihauf, Gerhard; and Brandauer, Emil, 4,507,353, Cl. 428-222.000.

Schlichtig, Ralph C. Absorption type heat transfer system functioning as a temperature pressure potential amplifier. 4,506,524, Cl. 62-476.000.

Schlumberger Technology Corporation: *See*—
Hertzog, Russel C.; and Nelligan, William B., 4,507,554, Cl. 250-270.000.

Schmaltz, Armand J.: *See*—
Adamson, Thomas; and Schmaltz, Armand J., 4,507,027, Cl. 408-197.000.

Schmid, Christoph, to Luk Lamellen und Kupplungsbau GmbH. Automatic motor and clutch controls. 4,506,770, Cl. 192-0.080.

Schmid, Hans, to Megomat AG. Cable finishing apparatus. 4,506,566, Cl. 81-9.510.

Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, to Air Products and Chemicals, Inc. Polyurethane compositions having low hysteresis. 4,507,459, Cl. 528-64.000.

Schmidt, Hubertus; and Mucheyer, Norbert, to Mannesmann Rexroth GmbH. Device for controlling a connection between a pressure medium source and a fluid supply container in a pressure medium operated system. 4,506,859, Cl. 251-63.000.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. 3-[(Substituted-amino)(thienyl)methyl]-1H-indoles. 4,507,483, Cl. 546-201.000.

Schmidt, Peter C.: *See*—
Reiff, Friedrich; Hartner, Hartmut; Basedow, Arno; Hugenbusch, Hans-Wolfgang; Schmidt, Peter C.; and Bardonner, Hans, 4,507,511, Cl. 568-852.000.

Schmitz, Anton: *See*—
Thoma, Wilhelm; Langel, Rolf; Schmitz, Anton; and Schroer, Walter, 4,507,413, Cl. 524-42.000.
Schmutz, Karl: *See*—
Fosco, Guido; and Schmutz, Karl, 4,507,623, Cl. 331-154.000.
Schneider, Norbert: *See*—
Kohl, Albert; Schneider, Norbert; Ley, Gregor; Balz, Werner; Melzer, Milena; and Jakusch, Helmut, 4,507,457, Cl. 427-48.000.
Schnider, Jean-Pierre: *See*—
Mosimann, David; Walther, Theodor; and Schnider, Jean-Pierre, 4,507,085, Cl. 433-126.000.
Schoenmeyr, Ivar L., to Carr-Griff, Inc. Liquid dispensing system. 4,507,054, Cl. 417-12.000.
Schoenmeyr, Ivar L., to Carr-Griff, Inc. Wobble plate pump and drive mechanism therefor. 4,507,058, Cl. 417-270.000.
Schott Glass Technologies, Inc.: *See*—
Kassner, Reinhard; Mader, Karl-Heinz; and Cook, Lee M., 4,507,393, Cl. 501-75.000.
Schott, Robert E., to Allis-Chalmers Corporation. Electrically controlled hydraulic clutch for a front wheel drive. 4,506,773, Cl. 192-52.000.
Schramm, Michael E.; and Vezirian, Edward, to Smith International, Inc. Rock bit cone retention. 4,506,997, Cl. 384-96.000.
Schrodl, Hermann, to Fried.Krupp Gesellschaft mit beschraenkter Haftung. Impact crusher. 4,506,837, Cl. 241-97.000.
Schroeck, Calvin W. Phosphorus-containing metal salt/olefin compositions and reaction products of same with active sulfur. 4,507,215, Cl. 252-32.70E.
Schroer, Walter: *See*—
Thoma, Wilhelm; Langel, Rolf; Schmitz, Anton; and Schroer, Walter, 4,507,413, Cl. 524-42.000.
Schulte, Harmut: *See*—
Geis, Heinz; Lautenschlager, Heinz; Schulte, Harmut; and Uliczka, Siegmund, 4,507,102, Cl. 474-101.000.
Schultz, Jurgen: *See*—
Waas, Heinrich; Freitas, Ayres; Schultz, Jurgen; and Varges, Gunter, 4,506,617, Cl. 114-41.000.
Schunck, Erich: *See*—
Hesse, Wolfgang; Sattelmeyer, Richard; and Schunck, Erich, 4,507,419, Cl. 524-327.000.
Schurman, John W.: *See*—
Schurman, Richard H.; Schurman, John W.; Clark, Richard W.; and Reiter, Steven, 4,506,626, Cl. 118-665.000.
Schurman, Richard H.; Schurman, John W.; Clark, Richard W.; and Reiter, Steven. Apparatus for controlling the proportions of a fluid. 4,506,626, Cl. 118-665.000.
Schwab, Alfred: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,507,312, Cl. 514-471.000.
Schwab, Carl E., to General Signal Corporation. Dew point measurement and time trend analysis. 4,506,994, Cl. 374-28.000.
Schweckendieck, Bernd. *See*—
Kunze, Wolfgang; and Schweckendieck, Bernd, 4,506,547, Cl. 73-150.00R.
Sclavo: *See*—
Tabacco, Alessandro; and Meiattini, Franco, 4,507,388, Cl. 435-12.000.
Scott Bader Company Limited: *See*—
Goring, John O., 4,507,441, Cl. 525-438.000.
Scovill Inc.: *See*—
Kuypers, Harold A., 4,506,695, Cl. 137-223.000.
Sears, Barry D., to Lipid Specialties, Inc. Magnetic compositions and magnetic memory devices prepared therefrom. 4,507,217, Cl. 252-62.540.
Secord, Nelson W., to Chrysler Corporation. Odometer reset mechanism. 4,507,549, Cl. 235-96.000.
Seeboth, Heinz: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.
Seefeldt, Roger L., to AT&T Technologies, Inc. Universal circuit pack container. 4,506,785, Cl. 206-334.000.
Seiler, Herbert; and Hegar, Gert, to Ciba-Geigy Corporation. Fibre-reactive dyes, containing both chloro and fluoro triazine radicals. 4,507,236, Cl. 534-634.000.
Seitetsu Kagaku Co., Ltd.: *See*—
Obayashi, Shigeji; Nakamura, Morio; Yamamoto, Takushi; and Fujikake, Masato, 4,507,438, Cl. 525-119.000.
Seitz Enginger Noll Maschinenbau Aktiengesellschaft: *See*—
Dennhardt, Werner, 4,506,709, Cl. 141-95.000.
Seki, Teruo; Yamauchi, Takahiko; and Aoyama, Keizo, to Fujitsu Limited. Constant operation speed logic circuit. 4,507,574, Cl. 307-448.000.
Sekine, Mitsuo: *See*—
Hashimoto, Shingo; and Sekine, Mitsuo, 4,507,572, Cl. 307-296.00R.
Sells, Donald E.: *See*—
Swaney, Gary; and Sells, Donald E., 4,506,522, Cl. 62-243.000.
Seragnoli, Enzo, to G.D. Societa per Azioni. Device for transferring bar shaped articles. 4,506,779, Cl. 198-461.000.
Serres, Bernard: *See*—
Cosse, Guy; and Serres, Bernard, 4,507,655, Cl. 340-641.000.
Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,507,209, Cl. 210-728.000.
SGS-Ates Componenti Elettronici SpA: *See*—
Siligoni, Marco; and Rossetti, Nazzareno, 4,507,525, Cl. 179-81.00R.
Sguazzi, Georges: *See*—
Bernou, Joseph; and Sguazzi, Georges, 4,506,821, Cl. 228-5.700.
Shabe, John: *See*—
Alvarez, Joseph A., III; Brennen, John F.; Krug, Robert W.; Gobioff, Bruce D.; and Shabe, John, 4,507,781, Cl. 370-104.000.
Shacket, Sheldon R. Ball and tube game apparatus and method. 4,506,892, Cl. 273-153.00R.
Shape Inc.: *See*—
Gelardi, Anthony L.; Gelardi, John; Landry, Vincent; and Pruneau, Diane, 4,506,846, Cl. 242-199.000.
Shapiro, Jacov, to Beit Shemesh Engines Ltd. Gas turbine engines. 4,506,502, Cl. 60-39.430.
Shar Products Company: *See*—
Goldner, Richard, 4,506,582, Cl. 84-280.000.
Sharp Kabushiki Kaisha: *See*—
Haneda, Isamu; and Myooi, Tetsuo, 4,507,743, Cl. 364-709.000.
Nishibori, Toshiki, 4,506,876, Cl. 271-104.000.
Sheem, Sang K., to Rockwell International Corporation. Optical transmitter with light source and optical amplifier combination. 4,507,775, Cl. 370-4.000.
Shell Oil Company: *See*—
Boom, Johannes; and Terlouw, Teunis, 4,506,704, Cl. 137-883.000.
Minderhoud, Johannes K.; and Post, Martin F. M., 4,507,404, Cl. 518-714.000.
Zwolle, Simon, 4,506,732, Cl. 166-292.000.
Shelton, John J., to Fife Corporation. Web manufacturing apparatus. 4,507,073, Cl. 425-466.000.
Shepard, Joseph F.: *See*—
Pliskin, William A.; Riseman, Jacob; and Shepard, Joseph F., 4,506,435, Cl. 29-576.00W.
Shepard, Roderick C.: *See*—
Bethoon, Walter D.; and Shepard, Roderick C., 4,506,688, Cl. 135-107.000.
Shepherd, Gary D.: *See*—
Mullen, Charles K.; Shepherd, Gary D.; Fernandez, Ramon B.; and Bergren, Kenneth B., 4,507,272, Cl. 423-447.400.
Sherer, Roger L. Flowable material measuring apparatus. 4,507,604, Cl. 324-71.100.
Shibata, Katsuhiko; and Sato, Mitsuyoshi, to Sony Corporation. Overwrapping film. 4,507,352, Cl. 428-201.000.
Shibazaki, Kenji: *See*—
Sugiura, Masamichi; and Shibazaki, Kenji, 4,506,974, Cl. 355-14.00R.
Shibuya Kogyo Co., Ltd.: *See*—
Konaka, Yukio, 4,507,168, Cl. 156-379.800.
Shibuya, Sadao: *See*—
Fujimoto, Hirotsugu; Hosono, Tatsukuma; Kimura, Hiroshi; Shibuya, Sadao; and Naruse, Akisuke, 4,507,260, Cl. 376-249.000.
Shibuya, Tsunenori; and Nakamura, Teruo, to Diesel Kiki Co., Ltd. Vane compressor having drive shaft journalled by roller bearings. 4,507,065, Cl. 418-15.000.
Shigenobu, Hiromichi; Nakabayashi, Takao; Akiyama, Kitio; Miida, Masao; and Karasawa, Hisashi, to Toshiba Electric Appliances Co., Ltd. Beverage brewing apparatus. 4,506,596, Cl. 99-289.00T.
Shiio, Tsuyoshi: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Shimizu, Eikou; and Shiio, Tsuyoshi, 4,507,282, Cl. 424-117.000.
Shikata, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cutting tool. 4,507,023, Cl. 407-103.000.
Shikatani, Yutaka: *See*—
Kuroda, Nobuyuki; Nakamura, Toru; Shikatani, Yutaka; Matsuura, Kazuo; and Miyoshi, Mitsuji, 4,507,448, Cl. 526-125.000.
Shikimi, Katsuji: *See*—
Matsumoto, Takeshi; Yoshida, Shuji; and Shikimi, Katsuji, 4,506,757, Cl. 180-294.000.
Shimada, Fumio: *See*—
Tsuchino, Hisanori; Teshima, Manami; Takeuchi, Hiroshi; and Shimada, Fumio, 4,507,379, Cl. 430-139.000.
Shimada, Keizo; Sasaki, Hideharu; Mera, Hiroshi; Sawaki, Toru; and Aoki, Akihiro, to Teijin Limited. Wholly aromatic halogenated polyamide fiber and film. 4,507,467, Cl. 528-348.000.
Shimada, Masayoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Surface defect detecting apparatus. 4,507,564, Cl. 250-563.000.
Shimada, Shigeru; Kuroda, Akira; Tomiuga, Junichi; and Ishikawa, Shinzi, to Hodogaya Chemical Co., Ltd. Water-base polyurethane emulsion. 4,507,430, Cl. 524-839.000.
Shimadzu Coporation: *See*—
Miki, Masayuki; and Tanigaki, Tetsuya, 4,506,590, Cl. 91-35.000.
Shimadzu Corporation: *See*—
Nakaoka, Eiichi, 4,507,610, Cl. 324-238.000.
Shimamura, Morihiko, to Jidosha Kiki Co., Ltd. Brake power servo booster. 4,506,592, Cl. 92-101.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,507,101, Cl. 474-82.000.
Shimiya, Keiji: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,507,563, Cl. 250-486.100.
Shimizu, Eikou: *See*—
Udaka, Shigezo; Miyashiro, Shigeyoshi; Shimizu, Eikou; and Shiio, Tsuyoshi, 4,507,282, Cl. 424-117.000.
Shimizu, Etsuo: *See*—
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,507,563, Cl. 250-486.100.

Shimizu, Kunio; Kame, Yuichi; and Tsuji, Yoshimasa, to Asahi Kasei Kogyo Kabushiki Kaisha. Reflection preventive light-shielding screen and a process for producing the same. 4,506,953, Cl. 350-276.00R.

Shimizu, Takao: *See*—
Ukai, Jun; and Shimizu, Takao, 4,507,543, Cl. 219-137.0PS.

Shimizu, Yoichi, to Kabushiki Kaisha Maruyama Seisakusho. Heddle frame. 4,506,707, Cl. 139-91.000.

Shimizu, Yoshihito, to Olympus Optical Co., Ltd. Leakage detector of endoscopes. 4,506,544, Cl. 73-45.500.

Shimkus, John W. X-ray film support. 4,507,799, Cl. 378-177.000.

Shimojo, Hirokazu; and Inamura, Toshio, to Kabushiki Kaisha Sigma Electronics Planning. Ignition device for internal combustion engines. 4,506,650, Cl. 123-620.000.

Shimomura, Takeshi; Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Oyama, Noboru, to Terumo Kabushiki Kaisha. Reference electrode. 4,507,194, Cl. 204-435.000.

Shimoyama, Mamoru; and Hoshina, Isamu. Packed bag cutter. 4,506,494, Cl. 53-551.000.

Shin Nippon Seitetsu K.K.: *See*—
Higo, Tsutomu; Mizutani, Shoji; Sawada, Yasuhiro; and Kengaku, Katsumi, 4,507,265, Cl. 422-186.000.

Shindo, Minoru: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Shinomiya, Tsutomu; Mori, Shigeki; and Higuchi, Hiroshi, to Hokkai Can Co., Ltd. Slitter apparatus. 4,506,577, Cl. 83-499.000.

Shiomi, Yasushi: *See*—
Miyazaki, Haruhiko; Shiomi, Yasushi; Fujitus, Satoru; Masunaga, Katsuro; and Yanagisawa, Hiroshi, 4,507,494, Cl. 560-193.000.

Shioyama, Tod K., to Phillips Petroleum Company. Alpha-olefin conversion. 4,507,506, Cl. 568-401.000.

Shiozaki, Tsugio: *See*—
Horiya, Keiichi; Shiozaki, Tsugio; and Sato, Koichiro, 4,507,668, Cl. 346-76.0PH.

Shiraki, Hiroyuki; and Abe, Tetsuro, to Takeda Chemical Industries, Ltd. Urethane acrylate compositions. 4,507,458, Cl. 528-49.000.

Shirley, Arthur R., Jr.; and Carney, Frederick T., Jr., to Tennessee Valley Authority. Enhanced heat transfer process by forced gas recirculation. 4,506,453, Cl. 34-12.000.

Shiroyama, Shoichi; Yamashita, Kazuo; and Morishita, Katsuji, to Sumitomo Metal Industries, Ltd.; and Tokai Rubber Industries, Ltd. Shock absorber for vehicular couplers. 4,506,868, Cl. 267-3.000.

Shizawa, Masao, to Orion Kasei Kabushiki Kaisha. Process and apparatus for injection-molding foamed article. 4,507,255, Cl. 264-45.100.

Showalter, Merle R., to Automotive Engine Associates. Servo valve for ultra-fast pressure regulation with controlled system damping. 4,506,861, Cl. 251-139.000.

Showalter, Merle R., to Automotive Engine Associates. Elastomerically supported pivoted pad bearing. 4,506,998, Cl. 384-312.000.

Shrum, Kenneth L.; and Heth, Edwin M., to Sun Studs, Inc. Veneer lathe. 4,506,714, Cl. 144-209.00R.

Shukuri, Katsuhiro; Inowa, Shigeru; and Kawamoto, Kiyoaki, to Konishiroku Photo Industry Co., Ltd. Cleaning device. 4,506,975, Cl. 355-15.000.

Shumaker, Dale E.: *See*—
Aschinger, William T.; Pfeifer, Jack F.; and Shumaker, Dale E., 4,507,714, Cl. 362-126.000.

SI Handling Systems, Inc.: *See*—
Jacoby, Charles E., 4,506,607, Cl. 108-60.000.

Sibral, Walter: *See*—
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,507,459, Cl. 528-64.000.

Siby, Sture, to ASEA Aktiebolag. Pressure-compensating device in load cells. 4,506,556, Cl. 73-862.630.

Siemens Aktiengesellschaft: *See*—
Blau, Heinrich; Gortz, Bernd; Grohmann, Werner; Meusel, Wolfgang; Niebergall, Heribert; and Waldmann, Hermann, 4,507,703, Cl. 361-193.000.
Jung, Albert, 4,507,710, Cl. 361-428.000.
Kehl, Rainer, 4,507,645, Cl. 340-310.00A.
Meyer, Fritz, 4,507,621, Cl. 331-78.000.
Plies, Erich, 4,507,559, Cl. 250-396.00R.
Poth, Rainer, 4,507,641, Cl. 337-6.000.
Westerberg, Hans; and Leandersson, Enar, 4,506,872, Cl. 269-322.000.
Ziegler, Alfred; and Musil, Gerhard, 4,507,568, Cl. 307-112.000.

Siemens-Albis AG: *See*—
Fosco, Guido; and Schmutz, Karl, 4,507,623, Cl. 331-154.000.

Siemens Corporate Research & Support, Inc.: *See*—
Tsikos, Constantine J., 4,507,557, Cl. 250-341.000.

Sierakoski, Joseph M.: *See*—
Kordosky, Gary A.; Mackay, Kenneth D.; Sudderth, R. Brantley; and Sierakoski, Joseph M., 4,507,268, Cl. 423-24.000.

Sieren, Gerald E., to Allis-Chalmers Corporation. Underhood muffler for tractor. 4,506,749, Cl. 180-69.200.

Siewert, Robert L.; and Varnelis, Edmund K., to Clark Equipment Company. Pivot joint. 4,507,005, Cl. 403-16.000.

Sika AG, vorm. Kaspar Winkler & Co.: *See*—
Burge, Theodor; and Bodenmann, Eugen, 4,507,154, Cl. 106-315.000.

Silicon Valley Group, Inc.: *See*—
Tam, Johann; Ashjaee, Jalal; Kuwaki, Nobuo B.; Ngo, Tuan M.; and Kung, Susan W., 4,507,078, Cl. 432-11.000.

Siligoni, Marco; and Rossetti, Nazzareno, to SGS-Ates Componenti Elettronici SpA. Transistorized bridge rectifier circuit with overcurrent protection for use in telephones. 4,507,525, Cl. 179-81.00R.

Sillard, Gilles: *See*—
Baril, Michel; and Sillard, Gilles, 4,507,632, Cl. 333-258.000.

Simes: *See*—
Vecchietti, Vittorio; Mussini, Emilio; and Ferrari, Giorgio, 4,507,307, Cl. 514-313.000.

Simm, Wolfgang; and Steine, Hans-Theo, to Castolin S.A. Coating material for the formation of abrasion-resistant and impact-resistant coatings on workpieces. 4,507,151, Cl. 75-251.000.

Simon, Jules A.; Young, John A.; Ford, Michael D.; and Bourgeois, Harold C., to Drilling Waste, Incorporated. Process for handling waste from oil well operations. 4,507,208, Cl. 210-721.000.

Simonson, John L.: *See*—
Marinak, Michael J.; and Simonson, John L., 4,507,486, Cl. 546-345.000.

Singer Company, The: *See*—
Larsen, Robert H.; and Odermann, Charles R., 4,506,614, Cl. 112-228.000.

Skiles, Jerry W.: *See*—
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,507,312, Cl. 514-471.000.

Skinner, Neal G., to Halliburton Company. Apparatus for placement and retrieval of downhole gauges. 4,506,731, Cl. 166-113.000.

Slawyk, Wilhelm; Balle, Gerhard; Munzer, Manfred; and Wohnhas, Adolf, deceased (by Wohnhas, Hannelor R. I.), to Bayer Aktiengesellschaft. High-impact polymer alloys. 4,507,444, Cl. 525-455.000.

Sloan-Kettering Institute for Cancer Research: *See*—
Pukel, Clifford S.; Lloyd, Kenneth O.; Travassos, Luiz R.; Dippold, Wolfgang G.; Oettgen, Herbert F.; and Old, Lloyd J., 4,507,391, Cl. 436-504.000.

Sloan, Mark L.: *See*—
Roesner, Raymond E.; and Sloan, Mark L., 4,507,552, Cl. 250-259.000.

Sloane, Neil J. A.: *See*—
Conway, John H.; and Sloane, Neil J. A., 4,507,648, Cl. 340-347.0DD.

Slovinsky, Manuel: *See*—
Sortwell, Edwin T.; Slovinsky, Manuel; and Mikkelsen, Alan R., 4,507,470, Cl. 528-499.000.

Smeltzer, Dennis V.: *See*—
Unger, Kim N.; Tibbals, Rory L.; and Smeltzer, Dennis V., 4,507,198, Cl. 209-166.000.

Smith, David T.: *See*—
Roberts, Graham S.; Smith, David T.; and Woolsey, Brian J., 4,506,595, Cl. 98-31.000.

Smith, Donald F., Jr.: *See*—
Chow, Sui W.; and Smith, Donald F., Jr., 4,507,363, Cl. 428-418.000.

Smith International, Inc.: *See*—
Schramm, Michael E.; and Vezirian, Edward, 4,506,997, Cl. 384-96.000.

Smith, Jackie E., to Hughes Tool Company. Method of connecting joints of drill pipe. 4,506,432, Cl. 29-458.000.

Smith, Peter H.; and Holub, Fred F., to General Electric Company. Food emission sensing. 4,507,529, Cl. 219-10.55A.

Smith, Peter H., to General Electric Company. Automatic defrost sensing arrangement for microwave oven. 4,507,530, Cl. 219-10.55B.

Smith, Peter W., to AT&T Bell Laboratories. Nonlinear all-optical time division multiplexer and demultiplexer. 4,507,776, Cl. 370-4.000.

Smith, Richard A. G., to Beecham Group p.l.c. Pharmacologically active compounds. 4,507,283, Cl. 424-94.000.

Smithers, Richard; and May, Carl B., to Union Oil Company of California. Apparatus for continuously blending viscous liquids with particulate solids. 4,506,982, Cl. 366-19.000.

Smithkline Beckman Corporation: *See*—
DeMarinis, Robert M.; Hieble, J. Paul; Kaiser, Carl; and Wilson, James W., 4,507,320, Cl. 514-605.000.
Rossignol, Jean F., 4,507,288, Cl. 514-143.000.

Smolanoff, Joel R., to Rohm and Haas Company. Arthropod repellents. 4,507,291, Cl. 514-278.000.

Smolik, John V.: *See*—
Adams, Gerald J.; Burkett, William L., Jr.; and Smolik, John V., 4,506,852, Cl. 244-158.00R.

SMW Schneider & Weisshaupt GmbH: *See*—
Hiestand, Karl, 4,507,031, Cl. 409-234.000.

Snap-On Tools Corporation: *See*—
Olson, Gene E.; Stout, Christopher B.; Grover, Donald D.; and Becker, Thomas P., 4,506,546, Cl. 73-119.00A.

Snyder, Clair W., Jr.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,506,940, Cl. 339-17.0LC.

Societe Miniere et Metallurgique de Penarroya: *See*—
Palvadeau, Claude; and Scheidt, Claude, 4,507,182, Cl. 204-35.100.

Societe Nationale Elf Aquitaine (Production): *See*—
Arretz, Emmanuel, 4,507,505, Cl. 568-62.000.

Soejima, Shigeo: *See*—
Mase, Syunzo; and Soejima, Shigeo, 4,507,394, Cl. 501-94.000.

Solar Turbines Incorporated: *See*—
Ogborne, Graham E.; and Hill, Frederick J., 4,506,503, Cl. 60-39.281.

Somlo, Tibor; and Regli, Johann, to Ciba-Geigy AG. Process for purifying crude monochloro- and monobromoanthraquinone. 4,507,240, Cl. 260-384.000.

Sommer Co.: *See*—
Sommer, Gordon M., 4,506,772, Cl. 192-18.00A.
Sommer, Gordon M., to Sommer Co. Modular accesories for clutch/-brake unit. 4,506,772, Cl. 192-18.00A.
Song, W. R.: *See*—
Johnston, John E.; Bloch, Ricardo; Ver Strate, Gary W.; and Song, W. R., 4,507,515, Cl. 585-12.000.
Sonoyama, Seiji: *See*—
Fujiwara, Yukio; Sonoyama, Seiji; and Imataki, Mitsumasa, 4,507,701, Cl. 361-127.000.
Sony Corporation: *See*—
Hara, Takeo; and Ito, Seiji, 4,506,857, Cl. 248-655.000.
Hayashi, Tsuneyuki, 4,507,637, Cl. 336-65.000.
Ishiguro, Mamoru; Matsuyama, Atsuo; and Yamamura, Kazumasa, 4,507,691, Cl. 360-14.300.
Sasaki, Shin, 4,507,692, Cl. 360-60.000.
Shibata, Katsuhiko; and Sato, Mitsuyoshi, 4,507,352, Cl. 428-201.000.
Soriano, David S.; Demmin, Timothy R.; and Robinson, Martin A., to Allied Corporation. β-Oximinoalkylphosphonic acid esters. 4,507,251, Cl. 260-944.000.
Sortwell, Edwin T.; Slovinsky, Manuel; and Mikkelsen, Alan R., to Diatec Polymers. Method of rapidly dissolving polymers in water. 4,507,470, Cl. 528-499.000.
South African Inventions Development Corporation: *See*—
Mundell, Peter J., 4,506,681, Cl. 128-92.00D.
Thackeray, Michael M.; and Goodenough, John B., 4,507,371, Cl. 429-191.000.
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, to Chevron Research Company. Coking contaminated oil shale or tar sand oil on retorted solid fines. 4,507,195, Cl. 208-11.00R.
Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile docking process, apparatus and system. 4,507,119, Cl. 604-280.000.
Sperry Corporation: *See*—
Fagnani, Matthew V., Jr.; and Martenas, Wayne B., 4,506,840, Cl. 241-101.700.
Rothenberg, Carl; Stangel, John J.; and Valentino, Pasquale A., 4,507,662, Cl. 343-376.000.
Spiniello Construction Company: *See*—
Donnelly, Frank, 4,506,624, Cl. 118-105.000.
Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Fluid hose connectors. 4,506,862, Cl. 251-149.500.
Spoor, Herbert: *See*—
Blum, Rainer; Spoor, Herbert; Holtmann, Gerhard; and Osterloh, Rolf, 4,507,456, Cl. 528-45.000.
Sportoletti, Giancarlo: *See*—
Cremonesi, Pietro; and Sportoletti, Giancarlo, 4,507,205, Cl. 210-638.000.
Sprague, David L.: *See*—
Christopher, Lauren A.; and Sprague, David L., 4,507,725, Cl. 364-724.000.
Sprecker, Mark A.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of perfume compositions, colognes and perfumed articles with 1-phenyl-penten-4-one-1 and methyl homologues thereof. 4,507,225, Cl. 252-522.00R.
Spreter, Victor: *See*—
Zellweger, Conrad; and Spreter, Victor, 4,506,654, Cl. 126-262.000.
Springs Industries, Inc.: *See*—
Hendrix, James E.; and Daniels, John Y., 4,507,350, Cl. 428-196.000.
Squire, Alan Bruce: *See*—
Phong-Anant, Dheera, 4,506,631, Cl. 122-2.000.
Srivastava, Gopal K., to Zenith Electronics Corporation. Self-gated AGC detector. 4,507,682, Cl. 358-178.000.
Stamicarbon B.V.: *See*—
Verhoeve, Cornelis W.; and Weterings, Cornelis A. M, 4,507,207, Cl. 210-714.000.
Standard Oil Company, The: *See*—
Dria, Dennis E.; Bremer, Noel J.; Dria, Myra A.; and McKain, Rodger W., 4,507,212, Cl. 252-8.55D.
Nolte, Kenneth G., 4,506,734, Cl. 166-308.000.
Standard Oil Company (Indiana): *See*—
Miller, Jeffrey T.; and Nevitt, Thomas D., 4,507,399, Cl. 502-63.000.
Miller, Jeffrey T.; and Nevitt, Thomas D., 4,507,400, Cl. 502-63.000.
Nimry, Tayseer S.; and Fields, Ellis K., 4,507,186, Cl. 204-158.00R.
Reed, Robert L., 4,507,275, Cl. 423-574.00R.
Stangel, John J.: *See*—
Rothenberg, Carl; Stangel, John J.; and Valentino, Pasquale A., 4,507,662, Cl. 343-376.000.
Stanley, Mary M.: *See*—
Adair, Paul C.; Duda, Homer G.; Burkholder, Amy L.; Wright, Richard F.; and Stanley, Mary M., 4,507,381, Cl. 430-246.000.
Stannard, Ivan C.: *See*—
Gordon, Kevin R.; Kelsey, Jeffrey R.; and Stannard, Ivan C., 4,507,411, Cl. 523-436.000.
Star, Albert A.; and Weick, John M., to Grumman Aerospace Corporation. Programmable signal analyzer. 4,507,740, Cl. 364-487.000.
Staron, James S.: *See*—
Asick, John C.; Douty, George H.; Landis, John M.; Snyder, Clair W., Jr.; and Staron, James S., 4,506,940, Cl. 339-17.0LC.
Starr, John B., Jr.: *See*—
Fox, Daniel W.; Kaduk, Bruce A.; and Starr, John B., Jr., 4,507,442, Cl. 525-439.000.
Stashko, Daniel R., to GTE Valeron Corporation. Cutting insert with chip control. 4,507,024, Cl. 407-114.000.
State Die & Engineering, Inc.: *See*—
Valentine, Al L.; Rinke, Bernard; and Wenzel, Chester M., 4,507,045, Cl. 414-753.000.
State of California, Department of Transportation: *See*—
Apostolos, John A., 4,506,485, Cl. 52-515.000.
Stauch, Bernhard: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.
Stauffer Chemical Company: *See*—
Carter, Charles G., 4,507,148, Cl. 71-94.000.
Lobo, Brian J., 4,507,252, Cl. 260-986.000.
Steinbiss, Eberhard: *See*—
Herchenbach, Horst; Wolter, Albrecht; and Steinbiss, Eberhard, 4,507,153, Cl. 106-100.000.
Steine, Hans-Theo: *See*—
Simm, Wolfgang; and Steine, Hans-Theo, 4,507,151, Cl. 75-251.000.
Steklenski, David J.; Upson, Donald A.; and Low, Howard M., to Eastman Kodak Company. Acrylonitrile copolymers as protective overcoats in photographic elements. 4,507,385, Cl. 430-523.000.
Steltenkamp, Michael S., to St. Regis Paper Company. Kraft pulping process. 4,507,172, Cl. 162-30.110.
Stephens, Robert, to Applied Power Inc. Tilt cab truck with anti-dive and anti-sway control. 4,506,751, Cl. 180-89.150.
Sterimatic Holdings Limited: *See*—
Dent, Hugh R., 4,507,118, Cl. 604-198.000.
Sterling Drug Inc.: *See*—
Wilson, Frank, 4,506,794, Cl. 215-206.000.
Stern, Marilyn M., to Ninth Moon. Maternity garment. 4,506,390, Cl. 2-221.000.
Stern, Marvin J., to Alloy Metals, Inc. Nickel base brazing alloy and method. 4,507,264, Cl. 420-443.000.
Stern, Warren C., to Burroughs Wellcome Co. Treatment of psychosexual dysfunctions. 4,507,323, Cl. 514-649.000.
Stevenson, Rosemary C., to Inventions International Incorporated. Closed finger painting device. 4,507,087, Cl. 434-98.000.
Stewart, Charles W., to Du Pont de Nemours, E. I., and Company. Elastomeric compositions containing treated PTFE. 4,507,439, Cl. 525-199.000.
Stewart, Richard L.: *See*—
Armstrong, Robert G.; and Stewart, Richard L., 4,507,070, Cl. 425-126.00S.
Stewart Stamping Corporation: *See*—
Brennan, Robert J.; and Meighen, Terrence, 4,506,944, Cl. 339-143.00R.
Stille, John K., to Polymer Science. Low molecular weight aromatic polymers with biphenylene end groups. 4,507,462, Cl. 528-125.000.
Stirco Inc.: *See*—
Neier, Benjamin R.; and Stirling, Donald L., 4,506,990, Cl. 366-299.000.
Stirling, Donald L.: *See*—
Neier, Benjamin R.; and Stirling, Donald L., 4,506,990, Cl. 366-299.000.
Stockel, Richard F. Animal litter. 4,506,628, Cl. 119-1.000.
Stokes, Kenneth B., to Medtronic, Inc. Drug dispensing body implantable lead. 4,506,680, Cl. 128-786.000.
Stolarczyk, Larry G.; and Owerko, John R., to A. R. F. Products. Security system with infrared optical position detector. 4,507,654, Cl. 340-545.000.
Stoll, Kurt; and Glattli, Hans-Heinrich. Adapter formed from a composite foamed adapter block having fluid channels and a process for its manufacture. 4,507,345, Cl. 428-137.000.
Stoltz, John W.: *See*—
Davis, Albert P., Jr.; Knight, Orien M.; and Stoltz, John W., 4,506,729, Cl. 166-65.00M.
Stone, Harvey: *See*—
Daly, Richard T.; Rhoades, Walter; Stone, Harvey; and Kaplan, Robert A., 4,507,789, Cl. 372-92.000.
Stoneham, Jeffrey R.: *See*—
Daniels, Steven D.; Stoneham, Jeffrey R.; and Erickson, John K., 4,507,254, Cl. 264-1.900.
Storage Technology Corporation: *See*—
Anderson, Robert L., 4,507,592, Cl. 318-268.000.
Storen, Harald, to Norsk Hydro a.s. Method of cleaning dust-containing gas mixtures from a urea plant. 4,507,129, Cl. 55-70.000.
Stottmann, Richard L.; and Dietz, Timothy J., to Huffy Corporation. Bicycle chainguard. 4,507,105, Cl. 474-144.000.
Stout, Christopher B.: *See*—
Olson, Gene E.; Stout, Christopher B.; Grover, Donald D.; and Becker, Thomas P., 4,506,546, Cl. 73-119.00A.
Straalsund, Jerry L.: *See*—
Bauer, Roger E.; Straalsund, Jerry L.; and Chin, Bryan A., 4,507,227, Cl. 252-626.000.
Straehle, Wolfgang; Denni, Raymond; and Marx, Matthias, to BASF Aktiengesellschaft. Process for purification of crude polyether polyols. 4,507,475, Cl. 536-120.000.
Strand, Sten T.: *See*—
Francke, Kurt O.; and Strand, Sten T., 4,506,559, Cl. 74-439.000.
Strandgren, Carl B. Wheel intended to work with a fluid. 4,507,049, Cl. 416-51.000.

Strehlow, Robert W., to Mixer Systems, Inc. Pan type mixing machine. 4,506,984, Cl. 366-65.000.

Streit, Werner; Witt, Linda; and Angstmann, Heinz-Dieter, to BASF Aktiengesellschaft. Aqueous suspensions of peroxydisulfates and their use as oxidative desizing agents for textile goods sized with starch. 4,507,220, Cl. 252-186.100.

Striepeke, Wilhelm: *See—*
Hofmann, Heinz; Striepeke, Wilhelm; Werner, Manfred; Kleinherne, Herbert; and Zillessen, Christoph, 4,507,021, Cl. 405-288.000.

Strohmayer, Herbert F.: *See—*
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,507,459, Cl. 528-64.000.

Strohmeyer, Charles, Jr., to Electrodyne Research Corp. Unfired drying and sorting apparatus for preparation of solid fuel and other solid material. 4,506,608, Cl. 110-245.000.

Strung, Norman. Portable mirror blind. 4,506,467, Cl. 43-1.000.

Stumfall, David M., to Printronix, Inc. Electronic apparatus having low radio frequency interference from system clock signal. 4,507,796, Cl. 375-106.000.

Stutz, Herbert; and Eckert, Gunter, to BASF Aktiengesellschaft. Preparation of crosslinked polyurethane ionomer dispersions. 4,507,431, Cl. 524-840.000.

Sudderth, R. Brantley: *See—*
Kordosky, Gary A.; Mackay, Kenneth D.; Sudderth, R. Brantley; and Sierakoski, Joseph M., 4,507,268, Cl. 423-24.000.

Suek, Edmond L., to Mobil Oil Corporation. Blends of polyvinyl chloride and copolymers containing para-methyl styrene and acrylonitrile having improved clarity. 4,507,435, Cl. 525-86.000.

Suga, Noriyoshi: *See—*
Andow, Fumio; Okita, Yuji; and Suga, Noriyoshi, 4,507,700, Cl. 361-80.000.

Suga, Yoshinori: *See—*
Kakogawa, Genjiro; Hasuo, Masayoshi; Suga, Yoshinori; and Kojima, Kazuhisa, 4,507,450, Cl. 526-128.000.

Sugarbaker, Daniel L.: *See—*
LaSarge, Eugene A.; Schermers, Franciscus; and Sugarbaker, Daniel L., 4,507,737, Cl. 364-453.000.

Sugavanam, Balasubramanyan, to Imperial Chemical Industries PLC. Triazole and imidazole compounds useful as fungicides and plant growth regulators. 4,507,140, Cl. 71-76.000.

Sugie, Toshinori: *See—*
Kawabata, Juheiji; Inoue, Toshio; Sugie, Toshinori; and Kobata, Fumihiro, 4,507,468, Cl. 528-388.000.

Sugie, Yutaka: *See—*
Furukawa, Genzo; Sugie, Yutaka; and Fujii, Masami, 4,507,015, Cl. 404-103.000.

Sugihara, Kunihiko: *See—*
Yoneda, Kenji; Sugihara, Kunihiko; and Ushimura, Shoji, 4,506,833, Cl. 239-533.400.

Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, to Hitachi, Ltd. Articulated industrial robot. 4,507,046, Cl. 414-735.000.

Suginuma, Atsushi: *See—*
Hayase, Isao; Suginuma, Atsushi; and Kishi, Atsuo, 4,507,068, Cl. 418-150.000.

Sugita, Kazuhiko: *See—*
Suzuki, Hiroshi; Tsuboi, Akira; and Sugita, Kazuhiko, 4,506,935, Cl. 308-5.00R.

Sugita, Toshio; and Kamiyama, Masahide. Process for accumulating and storing light energy and releasing the same therefrom for utilization. 4,507,561, Cl. 250-484.100.

Sugita, Yutaka: *See—*
Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, 4,507,755, Cl. 365-36.000.

Sugiura, Masamichi; and Shibazaki, Kenji, to Minolta Camera Kabushiki Kaisha. Copying machine. 4,506,974, Cl. 355-14.00R.

Sugiyama, Hiroyuki; and Ishida, Masaaki, to Komori Printing Machinery Co., Ltd. Impression cylinder device of sheet-fed printing press with turn-over mechanism. 4,506,602, Cl. 101-230.000.

Sugiyama, Masahiko; and Nishio, Kenichi, to Toyota Jidosha Kabushiki Kaisha. Piston head structure. 4,506,593, Cl. 92-212.000.

Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, to USV Pharmaceutical Corporation. Antihypertensive amides. 4,507,312, Cl. 514-471.000.

Sujansky, Vladimir; Tribuzio, Sergio; and Paull, Jolanta, to ICI Australia Limited. Nitric ester explosive compositions. 4,507,161, Cl. 149-21.000.

Sullivan, Jack M.; Kim, Yong K.; and Waerstad, Kjell R., to Tennessee Valley Authority. Acid type solid urea-nitric fertilizer. 4,507,139, Cl. 71-50.000.

Sumitomo Chemical Company, Limited: *See—*
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, 4,507,417, Cl. 524-101.000.
Ishizumi, Kikuo; Antoku, Fujio; and Asami, Yukio, 4,507,303, Cl. 514-255.000.
Yamada, Yoshimi; Ooishi, Tadashi; Kato, Toshiro; and Mukai, Kunio, 4,507,284, Cl. 514-140.000.

Sumitomo Electric Industries, Ltd.: *See—*
Doi, Yoshihiko; Maeda, Yoshiki; and Kobayashi, Mitsunori, 4,507,189, Cl. 204-192.00N.
Takemoto, Akira, 4,507,594, Cl. 318-615.000.

Sumitomo Gomu Kogyo Kabushiki Kaisha: *See—*
Furukawa, Genzo; Sugie, Yutaka; and Fujii, Masami, 4,507,015, Cl. 404-103.000.

Sumitomo Metal Industries, Ltd.: *See—*
Shiroyama, Shoichi; Yamashita, Kazuo; and Morishita, Katsuji, 4,506,868, Cl. 267-3.000.

Sun Studs, Inc.: *See—*
Shrum, Kenneth L.; and Heth, Edwin M., 4,506,714, Cl. 144-209.00R.

Sunada, Takuya, to Casio Computer Co., Ltd. Touch response apparatus for electronic keyboard musical instrument. 4,506,581, Cl. 84-1.100.

Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio. Gas sensor with improved perovskite type material. 4,507,643, Cl. 338-34.000.

Suncast Corporation: *See—*
Garcia, George L.; Recker, Richard D.; and Tisbo, Thomas A., 4,506,698, Cl. 137-355.260.

Suncor, Inc.: *See—*
Yong, Raymond N.; and Sethi, Amar J., 4,507,209, Cl. 210-728.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,507,724, Cl. 363-98.000.

Sundstrand Data Control, Inc.: *See—*
Bateman, Charles D., 4,507,742, Cl. 364-567.000.

Sundstrom, Erik W., to Santrade Ltd. Chain saw bar. 4,506,444, Cl. 30-122.000.

Susuki, Tosaku: *See—*
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Susuki, Tosaku, 4,507,465, Cl. 528-312.000.

Sutz, Richard K., to Wind Baron Corporation. Push-pull windmill head having double beam pumping jack. 4,507,060, Cl. 417-336.000.

Suzuki, Hiroshi; Tsuboi, Akira; and Sugita, Kazuhiko, to Toyoda Koki Kabushiki Kaisha. Bar-type slide guiding apparatus with hydrostatic bearings. 4,506,935, Cl. 308-5.00R.

Suzuki, Junichi; Maruta, Keiji; Noborimoto, Kazutaka; and Hineno, Satoshi. Optical track scanner. 4,507,765, Cl. 369-45.000.

Suzuki, Ryo: *See—*
Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, 4,507,755, Cl. 365-36.000.

Suzuki, Shigeo: *See—*
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Suzuki, Shinichi: *See—*
Kobayashi, Hisao; Ohno, Makoto; and Suzuki, Shinichi, 4,507,059, Cl. 417-270.000.

Suzuki, Tadashi: *See—*
Asano, Tadashi; Suzuki, Tadashi; and Fujii, Tadatsugu, 4,506,521, Cl. 62-238.700.

Suzuki, Takeo; Yurita, Yoshihiro; and Zenpo, Hideharu, to Yaskawa Electric Mfg. Co., Ltd. Cable support of a robot. 4,507,042, Cl. 414-680.000.

Suzuki, Yasuo: *See—*
Saito, Hiraku; Suzuki, Yasuo; Fujii, Katsumi; Miyazaki, Kaoru; and Horio, Takekazu, 4,507,233, Cl. 260-115.000.

Suzuki, Yujiro: *See—*
Maeoka, Hidehiko; Shimizu, Etsuo; Suzuki, Yujiro; Shimiya, Keiji; and Miura, Norio, 4,507,563, Cl. 250-486.100.

Svensen, Ottar H.: *See—*
Eilertsen, Odd J.; and Svensen, Ottar H., 4,507,636, Cl. 336-12.000.

Swaney, Gary; and Sells, Donald E., to Aero Engineering Corporation of Clearwater. Helicopter air conditioner compressor driving and mounting apparatus. 4,506,522, Cl. 62-243.000.

Swasey, Archie N., to USM Corporation. Converted temperature control roll. 4,506,727, Cl. 165-90.000.

Swick, Edwin G., to Illinois Tool Works Inc. Fastener assembly for thermal insulation end panel for a paper machine dryer cylinder. 4,506,459, Cl. 34-110.000.

Swift, Allan W., to E. J. Brooks Company. Security seal and tag holder. 4,506,415, Cl. 24-16.0PB.

Swift, Allan W., to E. J. Brooks Company. Security seal. 4,506,921, Cl. 292-318.000.

Symietz, Detlef, to USM Corporation. Adhesive containing zinc powder. 4,507,421, Cl. 524-425.000.

Syntex (U.S.A.) Inc.: *See—*
Verheyden, Julien P. H.; and Martin, John C., 4,507,305, Cl. 514-262.000.

Szymaszek, Paul G.: *See—*
Kocher, Erich J.; Szymaszek, Paul G.; and Nikolaus, John G., 4,507,064, Cl. 418-15.000.

Tabacco, Alessandro; and Meiattini, Franco, to Sclavo. Urea determination method. 4,507,388, Cl. 435-12.000.

Tabata, Norikazu: *See—*
Yagi, Shigenori; Ogawa, Shuji; Kuzumoto, Masaki; and Tabata, Norikazu, 4,507,537, Cl. 219-121.0LA.

Tabuchi, Toyoji; and Hikita, Mitsutaka, to Hitachi, Ltd. Electrode structure for saw device. 4,507,581, Cl. 310-313.00B.

Taga, Yasunori; and Sawada, Yutaka, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Heat wave shielding lamination. 4,507,547, Cl. 219-543.000.

Taguchi, Kazuo: *See—*
Ebizawa, Akio; Taguchi, Kazuo; and Okumura, Toshio, 4,507,191, Cl. 204-427.000.

Taiho Pharmaceutical Company, Limited: *See—*
Fujii, Setsuro; Unemi, Norio; and Takeda, Setsuo, 4,507,301, Cl. 514-274.000.
Micetich, Ronald J.; Yamabe, Shigeru; Ueda, Shuichi; Ishida, Naobumi; and Ishizawa, Takeshi, 4,507,239, Cl. 260-245.20R.

Taisho Pharmaceutical Co., Ltd.: *See*—
Tamai, Masaharu; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; Omura, Sadafumi; and Katunuma, Nobuhiko, 4,507,232, Cl. 260-112.50R.

Taiyo Musen Co. Ltd.: *See*—
Mori, Kenzo; and Ozawa, Mikio, 4,507,663, Cl. 343-440.000.

Takagiwa, Hiroyuki: *See*—
Wada, Tsuneo; Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; and Takagiwa, Hiroyuki, 4,507,378, Cl. 430-137.000.

Takahashi, Masanori; and Tateishi, Terutaka, to Fujitsu Limited. Error processing system using two different types of replace logic. 4,507,729, Cl. 364-200.000.

Takahashi, Michio: *See*—
Sugimoto, Noboru; Matsumoto, Yoshio; Takahashi, Michio; Kohno, Michinaga; and Sakaue, Shiyuki, 4,507,046, Cl. 414-735.000.

Takahashi, Tomohiko: *See*—
Murakami, Reiji; Uchida, Kohachi; Nakatomi, Yoshitsugu; and Takahashi, Tomohiko, 4,506,972, Cl. 355-3.0DD.

Takahashi, Yukoh: *See*—
Ishii, Tamaki; Yachigo, Shinichi; and Takahashi, Yukoh, 4,507,417, Cl. 524-101.000.

Takanashi, Shigeru: *See*—
Kaiho, Shin-ichi; Mizuno, Koji; Hata, Shun-ichi; Koizumi, Masuo; Honda, Masamitsu; Murakami, Yasushi; Takanashi, Shigeru; and Shindo, Minoru, 4,507,309, Cl. 514-379.000.

Takano, Shigemasa: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Takaoka, Michio; Moutai, Tsuneaki; and Miura, Isao, to Fujikura Cable Works, Limited, The. Insulating paper sheet of synthetic resin flakes and natural fibers. 4,507,358, Cl. 428-298.000.

Takase, Junji: *See*—
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, 4,507,469, Cl. 528-425.000.

Takashi, Morihiko: *See*—
Matsuda, Toshihiko; Takashi, Morihiko; and Yoshida, Mistuo, 4,507,693, Cl. 360-72.200.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,507,293, Cl. 516-226.000.

Takasugi, Wasao, to Hitachi, Ltd. Control circuit for controlling light source in optical disc device. 4,507,767, Cl. 369-54.000.

Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, to Fujisawa Pharmaceutical Co., Ltd. Antimicrobial cephem compounds. 4,507,293, Cl. 516-226.000.

Takayama, Makoto: *See*—
Fujiki, Makoto; and Takayama, Makoto, 4,507,688, Cl. 360-13.000.

Takeda Chemical Industries, Ltd.: *See*—
Shiraki, Hiroyuki; and Abe, Tetsuro, 4,507,458, Cl. 528-49.000.
Yamazaki, Kyuya; and Igarashi, Sachio, 4,507,447, Cl. 525-528.000.

Takeda, Setsuo: *See*—
Fujii, Setsuro; Umemi, Norio; and Takeda, Setsuo, 4,507,301, Cl. 514-274.000.

Takemoto, Akira, to Sumitomo Electric Industries, Ltd. DC servomotor position control. 4,507,594, Cl. 318-615.000.

Takemoto, Shizume: *See*—
Okuyama, Genichiro; Takemoto, Shizume; and Otani, Yasuhisa, 4,507,279, Cl. 424-63.000.

Takenaka, Kazuhiro: *See*—
Hoshino, Shigeo; Takenaka, Kazuhiro; and Muro, Hideo, 4,507,705, Cl. 361-283.000.

Takeshita, Masatoshi: *See*—
Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, 4,507,755, Cl. 365-36.000.

Takeuchi, Hiroshi: *See*—
Tsuchino, Hisanori; Teshima, Manami; Takeuchi, Hiroshi; and Shimada, Fumio, 4,507,379, Cl. 430-139.000.

Takeuchi, Teruaki: *See*—
Kodama, Naoki; Takeuchi, Teruaki; Suzuki, Ryo; Takeshita, Masatoshi; and Sugita, Yutaka, 4,507,755, Cl. 365-36.000.

Takimoto, Hiroyuki: *See*—
Kozuki, Susumu; Takimoto, Hiroyuki; and Maeda, Masaya, 4,507,689, Cl. 360-33.100.

Tam, James P.; Heath, William F., Jr.; and Merrifield, Robert B., to Research Corporation. Peptide synthesis reagents and method of use. 4,507,230, Cl. 260-112.50R.

Tam, Johann; Ashjaee, Jalal; Kuwaki, Nobuo B.; Ngo, Tuan M.; and Kung, Susan W., to Silicon Valley Group, Inc. Wafer handling apparatus and method. 4,507,078, Cl. 432-11.000.

Tam, Wilson: *See*—
Parshall, George W.; and Tam, Wilson, 4,507,241, Cl. 260-396.00R.

Tamai, Masaharu; Adachi, Takashi; Oguma, Kiyoshi; Hanada, Kazunori; Omura, Sadafumi; and Katunuma, Nobuhiko, to Taisho Pharmaceutical Co., Ltd. Peptide derivatives. 4,507,232, Cl. 260-112.50R.

Tamaki, Hiroshi: *See*—
Minami, Masana; Tamaki, Hiroshi; Sasaki, Tsuneo; and Kimura, Kazuaki, 4,507,647, Cl. 340-347.00P.

Tamaki, Kiyoshi: *See*—
Wada, Tsuneo; Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; and Takagiwa, Hiroyuki, 4,507,378, Cl. 430-137.000.

Tamamura, Toshiaki: *See*—
Morita, Masao; Tanaka, Akinobu; Imamura, Saburo; Tamamura, Toshiaki; and Kogure, Osamu, 4,507,384, Cl. 430-311.000.

Tamura, Tadashi: *See*—
Kondo, Kouichi; and Tamura, Tadashi, 4,507,666, Cl. 346-76.0PH.

Tan, Yoichi, to Fuji Xerox Co., Ltd. Digital transmission system. 4,507,778, Cl. 370-94.000.

Tanaka, Akinobu: *See*—
Morita, Masao; Tanaka, Akinobu; Imamura, Saburo; Tamamura, Toshiaki; and Kogure, Osamu, 4,507,384, Cl. 430-311.000.

Tanaka, Itsuo: *See*—
Sando, Yoshikazu; Goto, Tokuju; Tanaka, Itsuo; Ishidoshiro, Hiroshi; and Minakata, Matsuo, 4,507,539, Cl. 219-121.0PY.

Tanaka, Kazurou, to Nippon Gakki Seizo Kabushiki Kaisha. Method of processing data for musical score display system. 4,506,587, Cl. 84-462.000.

Tanaka, Koji; and Ueda, Minoru, to Japan Exlan Company Limited. Water-removing material usable for hydrophobic liquids and process for producing the same. 4,507,204, Cl. 210-497.010.

Tanaka, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Control system for a disc player apparatus. 4,507,770, Cl. 369-77.200.

Tanaka, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Motor drive apparatus. 4,507,771, Cl. 369-77.200.

Tangney, Thomas J.; and Ziemelis, Maris J., to Dow Corning Corporation. Silicones bearing acylated diaminohydrocarbyl radicals and method therefor. 4,507,455, Cl. 528-26.000.

Tani, Nobutaka: *See*—
Mita, Tetsuo; Nakanishi, Hirotazu; Takase, Junji; Isayama, Katsuhiko; and Tani, Nobutaka, 4,507,469, Cl. 528-425.000.

Tanigaki, Tetsuya: *See*—
Miki, Masayuki; and Tanigaki, Tetsuya, 4,506,590, Cl. 91-35.000.

Tanimura, Nobuyoshi: *See*—
Yasui, Tokumasa; Nakamura, Hideaki; Uchibori, Kiyofumi; Tanimura, Nobuyoshi; and Minato, Osamu, 4,507,759, Cl. 365-189.000.

Tano, Tetsuo; and Hayashi, Akira, to Lion Corporation. High concentration surfactant slurry. 4,507,223, Cl. 252-353.000.

Tarantino, Jeffrey W., to Friendly Ice Cream Corporation. Stratified chromatically distinct sherbet confection and method of making same. 4,507,326, Cl. 426-101.000.

Tardif, Jean, to Maisons Phenix. Means and method for preventing cracks from developing in an industrialized house. 4,507,009, Cl. 403-306.000.

Tateishi, Terutaka: *See*—
Takahashi, Masanori; and Tateishi, Terutaka, 4,507,729, Cl. 364-200.000.

Tatekura, Koichi; Yamamoto, Hitoshi; Nunokawa, Makoto; and Ejiri, Yoshihiro, to Kokusai Denshin Denwa Kabushiki Kaisha. Method and apparatus for core alignment of optical fibers. 4,506,947, Cl. 350-96.210.

Tateno, Kenichi: *See*—
Fujii, Hiroyuki; Tateno, Kenichi; and Nishikawa, Mikio, 4,507,675, Cl. 357-70.000.

Tchuempe-Tchuente, Germain. Mechanical support module for nucleic acid. 4,507,089, Cl. 434-279.000.

Tech Development Inc.: *See*—
Coons, Terry L., 4,507,047, Cl. 415-9.000.

Tecnomagnetica di Cardone, Grandini, Zaramella & C.S.a.s.: *See*—
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,507,635, Cl. 335-291.000.

Tecumseh Products Company: *See*—
Morse, Robert L.; and Hagan, Russell M., 4,506,519, Cl. 62-190.000.

Teich, Wesley W.; and Adamski, Joseph R., to Raytheon Company. Regulated microwave oven and method, using uniformly spaced, integral cycle control. 4,507,531, Cl. 219-10.55B.

Teichman, James E.: *See*—
Church, William H.; and Teichman, James E., 4,507,041, Cl. 414-641.000.

Teijin Limited: *See*—
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, 4,507,364, Cl. 428-457.000.
Kato, Yoshinori; Umemoto, Naoji; Saito, Masahiko; and Hara, Takeshi, 4,507,234, Cl. 260-121.000.
Shimada, Keizo; Sasaki, Hideharu; Mera, Hiroshi; Sawaki, Toru; and Aoki, Akihiro, 4,507,467, Cl. 528-348.000.

Teknetics, Inc.: *See*—
Payne, George C., 4,507,612, Cl. 324-329.000.

Tektronix, Inc.: *See*—
Bateman, Glenn, 4,507,615, Cl. 328-142.000.
Correll, Ronald E., 4,507,586, Cl. 315-3.000.
McCracken, David R.; and Larson, Robin R., 4,507,576, Cl. 307-475.000.
Nelson, Theodore G., 4,507,618, Cl. 330-126.000.

Teledyne Industries, Inc.: *See*—
Acker, Richard C., 4,506,693, Cl. 137-116.300.

Telesis Controls Corporation: *See*—
Robertson, John A., 4,506,999, Cl. 400-121.000.

Tenax Corporation: *See*—
Rich, Michael; and Ek, F. Donald, 4,506,856, Cl. 248-222.100.

Tencza, Thomas M.; and Patell, Mahesh K., to Bristol-Myers Company. Analgesic capsule. 4,507,276, Cl. 424-37.000.

Tennant, Clarence L.: *See*—
DeVall, Donald L.; DeVall, Hu D.; and Tennant, Clarence L., 4,506,501, Cl. 59-7.000.

Tennessee Valley Authority: *See*—
Shirley, Arthur R., Jr.; and Carney, Frederick T., Jr., 4,506,453, Cl. 34-12.000.
Sullivan, Jack M.; Kim, Yong K.; and Waerstad, Kjell R., 4,507,139, Cl. 71-50.000.

Terada, Sadatugu: *See*—
Wada, Tsuneo; Tamaki, Kiyoshi; Murata, Hideki; Terada, Sadatugu; and Takagiwa, Hiroyuki, 4,507,378, Cl. 430-137.000.
Terajima, Tsuneo: *See*—
Yamaguchi, Terumoto; and Terajima, Tsuneo, 4,506,722, Cl. 164-130.000.
Terlouw, Teunis: *See*—
Boom, Johannes; and Terlouw, Teunis, 4,506,704, Cl. 137-883.000.
Termolar S/A: *See*—
DeFreitas, Elias M., 4,506,812, Cl. 222-536.000.
Terumo Kabushiki Kaisha: *See*—
Kasai, Masaaki; Ichikawa, Toshiji; and Kosegaki, Kimiho, 4,507,415, Cl. 524-101.000.
Shimomura, Takeshi; Yamaguchi, Shuichiro; Ushizawa, Norihiko; and Oyama, Noboru, 4,507,194, Cl. 204-435.000.
Yoshida, Takao, 4,507,123, Cl. 604-408.000.
Tervcon Limited: *See*—
Grewe, Gunter P., 4,507,702, Cl. 361-161.000.
Terzian, Rouben T.; and Herbstler, Horst-Dieter, to Marvin Glass & Associates. Skating doll with legs having angled pivot axes. 4,507,098, Cl. 446-288.000.
Teshima, Manami: *See*—
Tsuchino, Hisanori; Teshima, Manami; Takeuchi, Hiroshi; and Shimada, Fumio, 4,507,379, Cl. 430-139.000.
Testa, Rodolfo: *See*—
Nardi, Dante; Motta, Gianni; Testa, Rodolfo; Graziani, Gabriele; and Casadio, Silvano, 4,507,308, Cl. 514-313.000.
Testamatic, Incorporated: *See*—
Geisel, Donald J., 4,507,605, Cl. 324-73.0PC.
Texaco, Inc.: *See*—
Naylor, Carter G.; and McCoy, David R., 4,507,211, Cl. 252-8.55D.
Texas Instruments Incorporated: *See*—
Agrawal, Mahendra P., 4,507,745, Cl. 364-709.000.
Beck, Jeffrey D.; Schaake, Herbert F.; Tregilgas, John H.; and Kinch, Michael A., 4,507,160, Cl. 148-191.000.
Frantz, Gene A.; and Lin, Kun-Shan, 4,507,750, Cl. 364-900.000.
Kaldas, George A., 4,507,734, Cl. 364-419.000.
Kwan, Stephen C., 4,507,577, Cl. 307-494.000.
Magar, Surendar S., 4,507,727, Cl. 364-200.000.
McElroy, David J., 4,507,756, Cl. 365-104.000.
McElroy, David J., 4,507,757, Cl. 365-104.000.
Trenkler, George; and Cooper, Lawrence E., 4,507,639, Cl. 336-115.000.
Textron, Inc.: *See*—
Chaplin, John B., 4,506,618, Cl. 114-67.00A.
Flatau, Carl R., 4,507,043, Cl. 414-719.000.
Lemont, Harold E., 4,506,849, Cl. 244-17.210.
Potter, E. L., 4,506,565, Cl. 76-25.00A.
Tezuka, Toshiro: *See*—
Abe, Masaru; Miyoshi, Isao; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,506,718, Cl. 152-361.00R.
Thackeray, Michael M.; and Goodenough, John B., to South African Inventions Development Corporation. Solid state cell wherein an anode, solid electrolyte and cathode each comprise a cubic-close-packed framework structure. 4,507,371, Cl. 429-191.000.
Thelen, Josef: *See*—
Hinssen, Hans-Klemens; Katscher, Werner; Loenissen, Karl-Josef; Moormann, Rainer; Seeboth, Heinz; Stauch, Bernhard; and Thelen, Josef, 4,507,267, Cl. 423-4.000.
Thiokol Corporation: *See*—
Chu, Yuan C., 4,507,188, Cl. 204-159.230.
Faupell, Lawrence C., 4,506,832, Cl. 239-265.350.
Hessler, Richard O., 4,506,539, Cl. 73-4.00R.
Melas, Andreas A.; and O'Grady, John W., Jr., 4,506,815, Cl. 222-630.000.
Thiotech, Inc.: *See*—
Unger, Kim N.; Tibbals, Rory L.; and Smeltzer, Dennis V., 4,507,198, Cl. 209-166.000.
Thise-Fourgon, Marie-Rita, to Goodyear Tire & Rubber Company, The. Woven wire fabric and a tire having a tread reinforcing ply made thereof. 4,506,717, Cl. 152-358.000.
Thoma, Fritz, to Dieter Graesslin Feinwerktechnik. Module unit time switch disk assembly. 4,507,526, Cl. 200-38.00R.
Thoma, Wilhelm; Langel, Rolf; Schmitz, Anton; and Schroer, Walter, to Bayer Aktiengesellschaft. Process for the preparation of coating compositions, aqueous dispersions of PU reactive systems and their use for coating. 4,507,413, Cl. 524-42.000.
Thomas, David A. Battery shock eliminator. 4,506,748, Cl. 180-68.500.
Thomas, Erwin: *See*—
Van Deyck, Frans; Weiss, Franz-Josef; Verberckt, Roger; Thomas, Erwin; Mangelschots, Benedikt; and Pijl, Paul, 4,507,271, Cl. 423-387.000.
Thomas, Robert C.; Caldwell, Robert D.; and Doner, Douglas E., to Dow Chemical Company, The. Ruthenium coated electrodes. 4,507,183, Cl. 204-98.000.
Thome, Paul. Method and device for the automatic checking of the soundness of the welds of mechano-weld assemblies. 4,506,549, Cl. 73-582.000.
Thompson, Alan E., to Expand-A-Line, Incorporated. Method and apparatus for replacing buried pipe. 4,507,019, Cl. 405-154.000.
Thompson, David J.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; Thompson, David J.; and Newton, David F., 4,506,957, Cl. 350-349.000.
Thompson, Douglas K., to General Motors Corporation. End seal for turbine blade bases. 4,507,052, Cl. 416-193.00A.
Thompson, Ernest R. Pipe closure device. 4,506,705, Cl. 138-89.000.
Thompson, John M.: *See*—
McKenna, John J.; and Thompson, John M., 4,507,752, Cl. 364-900.000.
Thompson, Larry J., to Equipment Company of America. Drum stacking rack. 4,506,796, Cl. 211-59.400.
Thomson, Alexander: *See*—
Roach, Peter F.; Caldwell-Nichols, Christopher J.; and Thomson, Alexander, 4,507,603, Cl. 324-61.00P.
Thomson-CSF: *See*—
Baril, Michel; and Sillard, Gilles, 4,507,632, Cl. 333-258.000.
Bui-Hai, Nhu, 4,507,665, Cl. 343-786.000.
Louet, Daniel; and Darnois, Gilbert, 4,507,631, Cl. 333-222.000.
Thorn EMI plc: *See*—
Coaton, James R.; and Hussey, Douglas, 4,507,584, Cl. 313-624.000.
Thornton, Richard D.: *See*—
Matthias, Dan W.; and Thornton, Richard D., 4,507,000, Cl. 400-144.200.
Three Sisters Ranch Enterprises: *See*—
Bullock, Joseph J., III, 4,506,797, Cl. 215-256.000.
Throckmorton, Peter E.: *See*—
Goel, Anil B.; and Throckmorton, Peter E., 4,507,243, Cl. 260-410.500.
Thyssen Nordseewerke GmbH: *See*—
Waas, Heinrich; Freitas, Ayres; Schultz, Jurgen; and Varges, Gunter, 4,506,617, Cl. 114-41.000.
Tibbals, Rory L.: *See*—
Unger, Kim N.; Tibbals, Rory L.; and Smeltzer, Dennis V., 4,507,198, Cl. 209-166.000.
Ting, Sai-Pei: *See*—
Axelrod, Robert J.; Campbell, John R.; and Ting, Sai-Pei, 4,507,436, Cl. 525-92.000.
Tioxide Group PLC: *See*—
Hudson, William G., 4,507,273, Cl. 423-558.000.
Tircot, Michel, to Commissariat a l'Energie Atomique. Apparatus for continuously metering vapors contained in the atmosphere. 4,506,510, Cl. 62-3.000.
Tirole, Jacques P. H.: *See*—
Lesgourgues, Jacques; and Tirole, Jacques P. H., 4,507,051, Cl. 416-97.00R.
Tisbo, Thomas A.: *See*—
Garcia, George L.; Recker, Richard D.; and Tisbo, Thomas A., 4,506,698, Cl. 137-355.260.
TMC Corporation: *See*—
Krob, Erwin; and Bauer, Helmut, 4,506,905, Cl. 280-633.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Okumura, Yoshiharu; Kamiyama, Setsuo; Furukawa, Hiroshi; and Kaneko, Katsumi, 4,507,512, Cl. 568-897.000.
Tobita, Chuo, to Amada Company, Limited. Shearing machine. 4,506,573, Cl. 83-153.000.
Tobler, Hans; and Hoegerle, Karl, to Ciba-Geigy Corporation. 2,4-Diamino-6-halo-5-trifluoromethylpyrimidines having herbicidal activity. 4,507,146, Cl. 71-92.000.
Togashi, Fusao: *See*—
Sakurada, Kazuyuki; Funyu, Yutaka; Togashi, Fusao; Kanno, Toyoji; and Masuda, Toshikazu, 4,506,531, Cl. 72-8.000.
Toibana, Yasuo; and Ueno, Kazuo, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Ceramics containing fibers of silicon carbide. 4,507,224, Cl. 252-516.000.
Tokai Rubber Industries, Ltd.: *See*—
Shiroyama, Shoichi; Yamashita, Kazuo; and Morishita, Katsuji, 4,506,868, Cl. 267-3.000.
Toki, Tsukasa: *See*—
Yoshinaka, Shigeo; Toki, Tsukasa; Tsuji, Tomoji; and Uchiyama, Seiji, 4,507,510, Cl. 568-811.000.
Tokita, Susumu: *See*—
Inoue, Hiromichi; Fukui, Masahiro; Goto, Yasuyuki; and Tokita, Susumu, 4,507,222, Cl. 252-299.630.
Tokusen Kogyo Kabushiki Kaisha: *See*—
Miyauchi, Toshiaki; and Yoneda, Osamu, 4,506,500, Cl. 57-212.000.
Tokyo Electric Company, Ltd.: *See*—
Horiya, Keiichi; Shiozaki, Tsugio; and Sato, Koichiro, 4,507,668, Cl. 346-76.0PH.
Tokyo Kagaku Kikai K.K.: *See*—
Minami, Masana; Tamaki, Hiroshi; Sasaki, Tsuneo; and Kimura, Kazuaki, 4,507,647, Cl. 340-347.00P.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Anbe, Yoshiharu, 4,506,532, Cl. 72-8.000.
Andow, Fumio; Okita, Yuji; and Suga, Noriyoshi, 4,507,700, Cl. 361-80.000.
Aoyama, Masaharu; Hiraki, Shunichi; and Yonezawa, Toshio, 4,507,673, Cl. 357-23.00R.
Fukumitsu, Akira; and Sagara, Shigetoshi, 4,507,769, Cl. 369-77.200.
Haruki, Kazuhito; Kohno, Takeshi; and Nagase, Yasuo, 4,507,739, Cl. 364-478.000.
Murakami, Reiji; Uchida, Kohachi; Nakatomi, Yoshitsugu; and Takahashi, Tomohiko, 4,506,972, Cl. 355-3.0DD.
Nagano, Katsumi, 4,507,573, Cl. 307-297.000.
Obara, Ken, 4,507,580, Cl. 310-214.000.
Ohhashi, Masahide, 4,507,749, Cl. 364-757.000.
Satoh, Saburoh; Gotoh, Tatumi; Horii, Kenji; and Akiyama, Hidenori, 4,507,266, Cl. 422-186.150.
Shikata, Hiroshi, 4,507,023, Cl. 407-103.000.
Shimada, Masayoshi, 4,507,564, Cl. 250-563.000.
Tanaka, Toshio, 4,507,770, Cl. 369-77.200.

Tanaka, Toshio, 4,507,771, Cl. 369-77.200.
Tsuboi, Kiyoshi, 4,507,667, Cl. 346-76.0PH.

Tolasch, Gerhard: *See—*
Baese, Horst; and Tolasch, Gerhard, 4,507,040, Cl. 414-403.000.

Tom, Glenn M., to Hercules Incorporated. Dicyclopentadiene thermoset polymer. 4,507,453, Cl. 526-283.000.

Tomalia, Donald A.; and Dewald, James R., to Dow Chemical Corporation, The. Dense star polymers having core, core branches, terminal groups. 4,507,466, Cl. 528-332.000.

Tomie, Takashi: *See—*
Kadokura, Sadao; Tomie, Takashi; and Naoe, Masahiko, 4,507,364, Cl. 428-457.000.

Tomisaka, Yasushi, to Kabushiki Kaisha Kobe Seiko Sho. Air fractionation method. 4,507,134, Cl. 62-30.000.

Tomiuga, Junichi: *See—*
Shimada, Shigeru; Kuroda, Akira; Tomiuga, Junichi; and Ishikawa, Shinzi, 4,507,430, Cl. 524-839.000.

Tonneson, Ronald J.: *See—*
Morey, William A.; and Tonneson, Ronald J., 4,507,656, Cl. 340-739.000.

Topping, Joseph R.; and Jones, John D., to British Aerospace Public Limited Company. Teaching robots. 4,506,448, Cl. 33-185.00R.

Toray Industries, Inc.: *See—*
Chiba, Kazumasa; Kobayashi, Kazuhiko; and Susuki, Tosaku, 4,507,465, Cl. 528-312.000.

Torbus, Marek A.; and Vujevic, Aleksandar, to Huettenes-Albertus Chemische Werke GmbH. Bonding agent cold-hardening under the formation of polyurethane for molded parts, its manufacture and its application. 4,507,408, Cl. 523-143.000.

Torii, Michiaki: *See—*
Hirooka, Seiji; and Torii, Michiaki, 4,507,516, Cl. 585-14.000.

Toro Company, The: *See—*
Doup, Leonard W., 4,506,702, Cl. 137-624.200.

Toshiba Electric Appliances Co., Ltd.: *See—*
Shigenobu, Hiromichi; Nakabayashi, Takao; Akiyama, Kitio; Miida, Masao; and Karasawa, Hisashi, 4,506,596, Cl. 99-289.00T.

Tosti, Luigi. Child's chariot. 4,506,901, Cl. 280-242.0WC.

Touch-On, Inc.: *See—*
Benedict, Ralph H., Jr., 4,507,716, Cl. 362-295.000.

Tourtellotte, Raymond E.: *See—*
Brown, Clyde O.; and Tourtellotte, Raymond E., 4,507,538, Cl. 219-121.00L.

Towmotor Corporation: *See—*
Leskovec, Edward V., 4,506,750, Cl. 180-69.210.

Toyo Ink Manufacturing Co., Ltd.: *See—*
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; Morishita, Hirosada; Takano, Shigemasa; Sawada, Manabu; and Kumano, Isao, 4,507,374, Cl. 430-56.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Suzuki, Hiroshi; Tsuboi, Akira; and Sugita, Kazuhiko, 4,506,935, Cl. 308-5.00R.

Toyokura, Nobuo: *See—*
Ogawa, Tetsuya; and Toyokura, Nobuo, 4,506,434, Cl. 29-571.000.

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Horii, Kingo; and Masui, Takatoshi, 4,506,638, Cl. 123-325.000.
Kanda, Mutsumi; Inoue, Tokuta; Matsushita, Souichi; and Nakanishi, Kiyoshi, 4,506,632, Cl. 123-41.350.
Katou, Takashi; and Itou, Takaaki, 4,506,644, Cl. 123-439.000.
Onuma, Masashi, 4,506,708, Cl. 141-4.000.
Sugiyama, Masahiko; and Nishio, Kenichi, 4,506,593, Cl. 92-212.000.

Trans-Texas Energy, Inc.: *See—*
Moorehead, Robert M.; Eppler, Susan G.; and Anderson, Mardis V., 4,507,735, Cl. 364-422.000.

Travassos, Luiz R.: *See—*
Pukel, Clifford S.; Lloyd, Kenneth O.; Travassos, Luiz R.; Dippold, Wolfgang G.; Oettgen, Herbert F.; and Old, Lloyd J., 4,507,391, Cl. 436-504.000.

Tregilgas, John H.: *See—*
Beck, Jeffrey D.; Schaake, Herbert F.; Tregilgas, John H.; and Kinch, Michael A., 4,507,160, Cl. 148-191.000.

Treichel, Richard; and Johnson, Daniel M., to Deere & Company. Control linkage. 4,506,560, Cl. 74-473.00R.

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Payne, Reginald K.; and Trett, John, 4,506,765, Cl. 187-29.00R.

Trexler, Ray W., Jr., to Paccar Inc. Plug-in instrumentation system. 4,507,706, Cl. 361-331.000.

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Trisolini, George S. Cleaning apparatus. 4,506,403, Cl. 15-229.00B.

Triumph-Adler A.G. fur Buround Informationstechnik: *See—*
Geis, Heinz; Lautenschlager, Heinz; Schulte, Harmut; and Uliczka, Siegmund, 4,507,102, Cl. 474-101.000.

Trolle, Sten. Saucepan, particularly for use by disabled persons. 4,506,657, Cl. 126-373.000.

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Wykypiel, Werner; and Tronich, Wolfgang, 4,507,491, Cl. 560-020.000.

Trost, David, to Perkin-Elmer Corporation, The. Electro-magnetic alignment assemblies. 4,507,597, Cl. 318-653.000.

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Leifeld, Ferdinand, 4,506,413, Cl. 19-105.000.

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Hodge, Malcolm H., 4,506,946, Cl. 350-96.210.

Trysinsky, Stanley. Racket frame comprised of a single continuous filament and resin. 4,506,887, Cl. 273-73.00F.

Tsai, Shirley C., to Occidental Research Corp. Oil shale beneficiation. 4,506,835, Cl. 241-20.000.

Tsai, Yih-Wan, to PPG Industries, Inc. Regenerator flow distribution by means of upstream and downstream air jets. 4,506,726, Cl. 165-1.000.

Tschudin-Mahrer, Rolf, to Irbit Holding AG. Flap for ventilation ducts. 4,506,699, Cl. 137-375.000.

Tseo, Gus G., to Warner-Lambert Company. Three-way valve for automatic sequencing of fluid flow. 4,506,691, Cl. 137-1.000.

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Tsilibes, George N., to Eastman Kodak Company. Method and apparatus for uniformly charging a surface. 4,507,373, Cl. 430-31.000.

Ts'O , Paul O. P.: *See—*
Miller, Paul S.; and Ts'O , Paul O. P., 4,507,433, Cl. 525-54.110.

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Suzuki, Hiroshi; Tsuboi, Akira; and Sugita, Kazuhiko, 4,506,935, Cl. 308-5.00R.

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Tsuchida, Tetsuo; and Horiike, Satoru. Rear suspension system for motorcycles. 4,506,755, Cl. 180-227.000.

Tsuchino, Hisanori; Teshima, Manami; Takeuchi, Hiroshi; and Shimada, Fumio, to Konishiroku Photo Industry Co., Ltd. Method for converting radiographic images. 4,507,379, Cl. 430-139.000.

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Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,507,293, Cl. 516-226.000.

Tsuji, Tomoji: *See—*
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Tsuji, Yoshimasa: *See—*
Shimizu, Kunio; Kame, Yuichi; and Tsuji, Yoshimasa, 4,506,953, Cl. 350-276.00R.

Tsukamoto, Masahiro, to NSK-Warner K.K. Tension locking mechanism of a retractor. 4,506,845, Cl. 242-107.700.

Tsukuni, Yumi: *See—*
Hayashi, Hirro, 4,506,716, Cl. 145-3.500.

Tsuruta, Hirobumi; and Kondo, Kiichi, to Sankyo Rikagaku Kabushiki Kaisha; and Daishin Kagaku Kogyo Kabushiki Kaisha. Material for a planographic plate and a method of preparing such material. 4,507,383, Cl. 430-275.000.

Tucker, Edwin L.; Waller, Richard H., III; and Wilson, Kenneth T., to International Business Machines Corporation. Protocol for determining physical order of active stations on a token ring. 4,507,777, Cl. 370-16.000.

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Turner, Jack C. Reciprocating piston electric motor. 4,507,579, Cl. 310-23.000.

Tustaniwskyj, Jerry I., to Burroughs Corporation. Socket incorporating serially coupled springs. 4,506,941, Cl. 339-75.00M.

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Ube Industries, Ltd.: *See—*
Miyazaki, Haruhiko; Shiomi, Yasushi; Fujitus, Satoru; Masunaga, Katsuro; and Yanagisawa, Hiroshi, 4,507,494, Cl. 560-193.000.

Uchibori, Kiyofumi: *See—*
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Uchida, Kohachi: *See—*
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Uchiyama, Seiji: *See—*
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Ueda, Shuichi: *See—*
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Ueda, Tatehito: *See—*
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Ueda, Tsunesuke, to Q.P. Corporation. Process for preparing edible products in the form of capsules. 4,507,327, Cl. 426-276.000.

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UFI Engineering & Manufacturing Co., Inc.: *See—*
Miksitz, Frank J., 4,506,811, Cl. 222-411.000.

Ukai, Jun; and Shimizu, Takao, to Mitsubishi Denki Kabushiki Kaisha. Pulse arc welding method. 4,507,543, Cl. 219-137.0PS.

Ulbing, Otmar, to USM Corporation. Automated railroad bearing handling machine. 4,506,424, Cl. 29-252.000.

Uliczka, Siegmund: *See*—
Geis, Heinz; Lautenschlager, Heinz; Schulte, Harmut; and Uliczka, Siegmund, 4,507,102, Cl. 474-101.000.
Ulmer, Harry E.: *See*—
Mathew, Chempolil T.; and Ulmer, Harry E., 4,507,248, Cl. 260-500.50H.
UMC Industries, Inc.: *See*—
Fleer, Thomas P., 4,507,550, Cl. 235-449.000.
Umemoto, Naoji: *See*—
Kato, Yoshinori; Umemoto, Naoji; Saito, Masahiko; and Hara, Takeshi, 4,507,234, Cl. 260-121.000.
Unemi, Norio: *See*—
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Unger, Kim N.; Tibbals, Rory L.; and Smeltzer, Dennis V., to Thiotech, Inc. Flotation collectors and methods. 4,507,198, Cl. 209-166.000.
Union Carbide Corporation: *See*—
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Union Oil Company of California: *See*—
Aldorf, Henry E., 4,507,214, Cl. 252-18.000.
Kay, D. Alan R.; and Wilson, William G., 4,507,149, Cl. 75-58.000.
Marsh, Glenn A., 4,506,540, Cl. 73-29.000.
Smithers, Richard; and May, Carl B., 4,506,982, Cl. 366-19.000.
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; Thompson, David J.; and Newton, David F., 4,506,957, Cl. 350-349.000.
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United States Borax & Chemical Corporation: *See*—
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Administrator Environmental Protection Agency: *See*—
Meyer, Raymond A.; Howard, Frederick S.; and Brugger, John E., 4,507,762, Cl. 367-137.000.
Air Force: *See*—
Aguirre, Donald G., 4,507,602, Cl. 324-58.00R.
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Borg, Henry A., 4,507,086, Cl. 434-29.000.
Bruce, Charles W.; Kunkel, Kenneth E.; and Webb, Fred C., 4,506,553, Cl. 73-861.650.
Dezenberg, George J.; and Cooper, Charles E., Jr., 4,507,786, Cl. 372-33.000.
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Cowell, Gary K.; and DiGuiseppe, Carl P., 4,507,259, Cl. 376-173.000.
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Gobeli, Garth W., 4,506,914, Cl. 283-70.000.
Hammersand, Fred G.; and Witkowski, Anthony J., 4,506,822, Cl. 228-200.000.
Prono, Daniel S., 4,507,589, Cl. 315-111.010.
Prono, Daniel S.; Caporaso, George J.; and Briggs, Richard J., 4,507,614, Cl. 328-233.000.
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Bailard, James A.; and Jenkins, Scott A., 4,506,686, Cl. 134-57.00R.
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U.S. Philips Corporation: *See*—
Dijkstra, Jan; and Roza, Engel, 4,507,619, Cl. 330-297.000.
Hutter, Heinrich, 4,507,696, Cl. 360-109.000.
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United States Pipe and Foundry Company: *See*—
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United States Steel Corporation: *See*—
Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 4,507,190, Cl. 204-206.000.
Perfetti, Bruno M., 4,507,360, Cl. 428-336.000.
United States Surgical Corporation: *See*—
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United Technologies Corporation: *See*—
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Kronogard, Sven-Olof, deceased; and Linden, Allan, administrator, 4,506,509, Cl. 60-720.000.
University of Georgia Research Foundation, Inc.: *See*—
King, Allen D., Jr.; King, R. Bruce; and Linn, Donald E., Jr., 4,507,185, Cl. 204-157.10R.
University of Pennsylvania, Trustees of the: *See*—
Brighton, Carl T.; and Black, Jonathan, 4,506,674, Cl. 128-419.00F.
UOP Inc.: *See*—
McCollin, Chris D.; Allred, Richard E.; Bearl, Leslie K.; and Card, David C., 4,506,730, Cl. 166-85.000.
Upjohn Company, The: *See*—
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Ury, Michael G.: *See*—
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Usher, Thomas C.; and Patel, Natu. Manufacture of diethylaminoethyl dextrans. 4,507,472, Cl. 536-51.000.
Ushimura, Shoji: *See*—
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USM Corporation: *See*—
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Swasey, Archie N., 4,506,727, Cl. 165-90.000.
Symietz, Detlef, 4,507,421, Cl. 524-425.000.
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Usui, Toshifumi; and Yanagisawa, Syozo, to Hitachi, Ltd. Exhaust emission control device for diesel engine. 4,506,506, Cl. 60-303.000.
USV Pharmaceutical Corporation: *See*—
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,507,300, Cl. 514-280.000.
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Youssefyeh, Raymond D.; and Jones, Howard, 4,507,316, Cl. 514-510.000.
Utsunomiya, Tadashi; Matsumuro, Yasuhiko; and Saigo, Hideaki, to Bridgestone Tire Company Limiited. Rubber compound for conveyor belts. 4,507,418, Cl. 524-318.000.
V. E. Anderson Mfg. Co.: *See*—
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Boll, Richard; and Friedrichs, Michael, 4,507,651, Cl. 340-365.00L.
Valentine, Al L.; Rinke, Bernard; and Wenzel, Chester M., to State Die & Engineering, Inc. Robotic manipulator including actuating unit. 4,507,045, Cl. 414-753.000.
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Rothenberg, Carl; Stangel, John J.; and Valentino, Pasquale A., 4,507,662, Cl. 343-376.000.
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Valsamakis, Emmanuel A.: *See*—
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Vanderlaan, Robert D., to Pneumo Corporation. Force motor with null centering and null position bias. 4,507,634, Cl. 335-272.000.
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Dolan, Richard J.; Cangiano, Frank; and Van der Linde, John, 4,507,712, Cl. 362-61.000.
van der Werf, Bernardus T.; and van der Hoorn, Gustaaf H. A., to U.S. Philips Corporation. Method of electrodepositing a homogenebusly thick metal layer, metal layer thus obtained and the use of the metal layer thus obtained, device for carrying out the method and resulting matrix. 4,507,180, Cl. 204-5.000.
Van Deyck, Frans; Weiss, Franz-Josef; Verberckt, Roger; Thomas, Erwin; Mangelschots, Benedikt; and Pijl, Paul, to BASF Aktiengesellschaft. Removal of nitrous oxide from gases containing hydrogen, nitric oxide and nitrous oxide. 4,507,271, Cl. 423-387.000.
Vanlerberghe, John P. Tiltable rudder. 4,506,621, Cl. 114-162.000.
van Rinsum, Cornelis, to MTU-Motoren- Und Turbinen-Union Friedrichshafen GmbH. Valve control for a reciprocating piston internal combustion engine. 4,506,635, Cl. 123-90.220.
Varges, Gunter: *See*—
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Vercaemer, Claude: *See*—
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Verheyden, Julien P. H.; and Martin, John C., to Syntex (U.S.A.) Inc. 9-(1,3-Dihydroxy-2-propoxymethyl)guanine as antiviral agent. 4,507,305, Cl. 514-262.000.

Verhoeve, Cornelis W.; and Weterings, Cornelis A. M, to Stamicarbon B.V. Process for the chemical removal of phosphorus compounds from waste water. 4,507,207, Cl. 210-714.000.

Verhoeven, Leonardus A. J.; Scheltema, Otto E.; and Carels, Walter E., to U.S. Philips Corporation. Method of and device for X-ray processing. 4,507,681, Cl. 358-111.000.

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Ver Strate, Gary W.: *See*—
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Vial, Raymond, to Cledid S.A. Ingot mold with adjustable dimensions for a continuous casting machine. 4,506,724, Cl. 164-436.000.

Vickers, Stanley E.: *See*—
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Kocher, Erich J.; Szymaszek, Paul G.; and Nikolaus, John G., 4,507,064, Cl. 418-15.000.

Vining, Herbert C.; and Ryan, Clara G. Syringe apparatus with retractable needle. 4,507,117, Cl. 604-196.000.

Vioglio, Sergio: *See*—
Franceschi, Giovanni; and Vioglio, Sergio, 4,507,295, Cl. 260-239.30P.

Viola, Frank J.; and Scaduto, Anthony, to Parker-Hannifin Corporation. Muffler clamp. 4,506,418, Cl. 24-277.000.

Vlattas, Isidoros, to Ciba-Geigy Corporation. Imidazo[1,2-c][1,3]benzodiazepines. 4,507,311, Cl. 260-239.0BD.

Voegeli, Ronald C. Newspaper display machine. 4,506,776, Cl. 194-54.000.

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Hoyer, Otto; Antensteiner, Norbert; and Fortner, Walter, 4,506,425, Cl. 29-402.180.
Nagl, Martin, 4,507,079, Cl. 432-95.000.
Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,506,932, Cl. 299-1.000.

Vogel, Ernst; and Berger, Fritz. Pilot lamp. 4,507,528, Cl. 200-302.200.

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Gohrich, Klaus; and Vogt, Heinz, 4,507,593, Cl. 318-563.000.

Vogt, William R.; and Wynne, John M., to Baker Industries, Inc. Bidirectional, interactive fire detection system. 4,507,652, Cl. 340-501.000.

Vohringer, Gerhard F., to ESB Elektrostatische Spruh und Beschichtungsanlagen G.F. Vohringer GmbH. Powder spray chamber. 4,506,625, Cl. 118-312.000.

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Vujevic, Aleksandar: *See*—
Torbus, Marek A.; and Vujevic, Aleksandar, 4,507,408, Cl. 523-143.000.

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Kupper, Wilhelm, 4,506,420, Cl. 28-190.000.
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Waas, Heinrich; Freitas, Ayres; Schultz, Jurgen; and Varges, Gunter, to Thyssen Nordseewerke GmbH. Ship. 4,506,617, Cl. 114-41.000.

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Wade, James J., to Riker Laboratories, Inc. Process for tetrazolylpyrimidinone derivatives. 4,507,477, Cl. 544-250.000.

Wadell, Georg, to Gislaved Aktiebolag. Vehicle track having flexible interconnected links. 4,506,933, Cl. 305-35.00R.

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Wakino, Kikuo, to Murata Manufacturing Co., Ltd. Noise filter for connectors. 4,507,630, Cl. 333-182.000.

Waldmann, Hermann: *See*—
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Waldner, Paul R.: *See*—
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Waldo, Paul D.: *See*—
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Walker, Richard A.; and Douglas, Robert J., to Emhart Industries, Inc. Takeout tong head. 4,506,923, Cl. 294-87.100.

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Wally, Michael, to Chemie und Filter GmbH. Diaphragm pump. 4,507,062, Cl. 417-413.000.

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von Rappard, Gerhard; and Grundmann, Jurgen, 4,507,244, Cl. 260-428.500.

Walther, Theodor: *See*—
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Wardlaw, Louis J., III. Preheating insert for heavy wall pipe. 4,507,082, Cl. 432-224.000.

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Bruso, Loran H., 4,506,787, Cl. 206-363.000.
Tseo, Gus G., 4,506,691, Cl. 137-1.000.

Watabe, Nobuo, to Aderans Company, Ltd. Moisture-permeable sheets. 4,507,356, Cl. 428-252.000.

Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for fault time operating of an elevator 4,506,766, Cl. 187-29.00R.

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Baron, Walter J., 4,506,703, Cl. 137-625.430.

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Arpine, Donald A., 4,506,499, Cl. 57-127.500.

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Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,506,438, Cl. 29-739.000.

Webb, Fred C.: *See*—
Bruce, Charles W.; Kunkel, Kenneth E.; and Webb, Fred C., 4,506,553, Cl. 73-861.650.

Webster, Daniel R., to C.T.R. Inc. Compositions useful for restoring grout. 4,507,424, Cl. 524-442.000.
Wedding, Paul W. Post light. 4,507,715, Cl. 362-153.000.
Weick, John M.: *See—*
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Werner, Robert O. Pneumatic line break control system and method. 4,507,128, Cl. 48-193.000.
Werquin, Jean C.; and Mercier, Bernard, to Union Siderurgique du Nord et de l'est de la France. Rolling mill roll for a hot train of rolls. 4,507,366, Cl. 428-682.000.
Westerberg, Hans; and Leandersson, Enar, to Siemens Aktiengesellschaft. Device for mounting accessories on a patient support apparatus. 4,506,872, Cl. 269-322.000.
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Kazanjy, Robert P., 4,506,588, Cl. 89-34.000.
Westinghouse Electric Co.: *See—*
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Williams, Bruce E.: *See—*
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Williams, James E., to Cuisinarts Research & Development, Inc. Dual cover and feed tube protector actuation apparatus for a food processor. 4,506,836, Cl. 241-37.500.
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Willis, John G. Electro-pneumatic assembly device. 4,507,707, Cl. 361-380.000.
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Wilson, Norman. Deciphering apparatus. 4,507,088, Cl. 434-112.000.
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Wilson, William G.: *See—*
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Wimbush, Maurice J., to Automotive Products plc. Reservoirs for liquid pressure control systems. 4,506,507, Cl. 60-584.000.
Wincent, Karl T., to Litton Systems, Inc. Paper tape feed and drive mechanism. 4,507,003, Cl. 400-636.000.
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Wood, Charles H.; and Ury, Michael G., to Fusion Systems Corporation. Microwave generated electrodeless lamp for producing bright output. 4,507,587, Cl. 315-39.000.
Wood, Charles L.; and Benton, Clarence E. Lathe apparatus especially for brake drums and discs. 4,506,570, Cl. 82-4.00A.
Wood, David D., Jr. Removeable forecab for motorcycles. 4,506,753, Cl. 180-210.000.
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Wunsch, Erich, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Method for preparing peptides and intermediate products. 4,507,235, Cl. 260-112.50R.
Wykhuis, Lloyd A., to Deere & Company. Axle tube and hydraulic motor housing mounting arrangement. 4,506,747, Cl. 180-62.000.
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Horgan, Anthony M.; Kazmaier, Peter M.; and Burt, Richard A., 4,507,480, Cl. 546-94.000.
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Yagi, Shigenori; Ogawa, Shuji; Kuzumoto, Masaki; and Tabata, Norikazu, to Mitsubishi Denki Kabushiki Kaisha. Silent discharge-type laser device. 4,507,537, Cl. 219-121.0LA.
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Yamada, Yoshimi; Ooishi, Tadashi; Kato, Toshiro; and Mukai, Kunio, to Sumitomo Chemical Company, Limited. Soil disinfectant. 4,507,284, Cl. 514-140.000.
Yamaguchi, Shigeo; and Okutsu, Tadayoshi, to Nitto Boseki Co. Ltd. Process for producing a prepreg of a glass fiber cloth. 4,507,337, Cl. 427-269.000.
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Yamakido, Kazuo; Hagiwara, Shiro; and Fujii, Fumiaki, to Hitachi, Ltd. PCM Encoder conformable to the A-law. 4,507,792, Cl. 375-30.000.
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Yamano, Seiichi; and Ogiwara, Haruo, to Nippon Telegraph & Telephone Public Corporation. DC-DC Converter for remote power feeding. 4,507,721, Cl. 363-21.000.
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Yoshida, Koichi; Hirayama, Yoshio; Oka, Yasuo; and Kajiyama, Takashi, to Nippon Light Metal Company Limited. Process of producing aluminum substrate for magnetic recording media. 4,507,179, Cl. 204-58.000.
Yoshida, Mistuo: *See*—
Matsuda, Toshihiko; Takashi, Morihiko; and Yoshida, Mistuo, 4,507,693, Cl. 360-72.200.
Yoshida, Noboru: *See*—
Ariki, Yusaku; Hino, Takio; and Yoshida, Noboru, 4,507,514, Cl. 570-262.000.
Yoshida, Shigeru, to Aisan Industry Co., Ltd. Fuel evaporation preventing device. 4,507,132, Cl. 55-320.000.
Yoshida, Shuji: *See*—
Matsumoto, Takeshi; Yoshida, Shuji; and Shikimi, Katsuji, 4,506,757, Cl. 180-294.000.
Yoshida, Takao, to Terumo Kabushiki Kaisha. Medical containers. 4,507,123, Cl. 604-408.000.
Yoshida, Tatsuya: *See*—
Nagano, Masami; Atago, Takeshi; and Yoshida, Tatsuya, 4,506,646, Cl. 123-501.000.
Yoshida, Toshio: *See*—
Sunano, Naomasa; Asahi, Naotatsu; and Yoshida, Toshio, 4,507,643, Cl. 338-34.000.
Yoshikawa, Seimi; Yamada, Hideo; and Okubo, Yoichi, to Pacific Industrial Co. Ltd. Cooling control system and expansion valve therefor. 4,506,518, Cl. 62-180.000.
Yoshimoto, Toshio: *See*—
Abe, Masaru; Miyoshi, Isao; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,506,718, Cl. 152-361.00R.

Yoshimura, Kazunori: *See*—
Ito, Katsuo; Murata, Bunjiro; and Yoshimura, Kazunori, 4,507,627, Cl. 333-105.000.

Yoshinaka, Shigeo; Toki, Tsukasa; Tsuji, Tomoji; and Uchiyama, Seiji, to Mitsubishi Gas Chemical Company, Inc. Process for producing xylyleneglycol. 4,507,510, Cl. 568-811.000.

Yoshiyuki, Uchida: *See*—
Kazumi, Maruyama; and Yoshiyuki, Uchida, 4,507,519, Cl. 136-258.000.

Yoshizumi, Keiichi: *See*—
Saimi, Tetsuo; and Yoshizumi, Keiichi, 4,507,766, Cl. 369-45.000.

Young, John A.: *See*—
Simon, Jules A.; Young, John A.; Ford, Michael D.; and Bourgeois, Harold C., 4,507,208, Cl. 210-721.000.

Youssefyeh, Raymond D.; and Jones, Howard, to USV Pharmaceutical Corporation. Antihypertensive compounds. 4,507,316, Cl. 514-510.000.

Yun, Jin H., to Gold Star Tele-Electric Co., Ltd., Inc. Loudspeaker telephone system. 4,507,524, Cl. 179-81.00B.

Yurita, Yoshihiro: *See*—
Suzuki, Takeo; Yurita, Yoshihiro; and Zenpo, Hideharu, 4,507,042, Cl. 414-680.000.

Zaramella, Bruno: *See*—
Cardone, Michele; Grandini, Angelo; and Zaramella, Bruno, 4,507,635, Cl. 335-291.000.

Zazzu, Victor: *See*—
Dingwall, Andrew G. F.; and Zazzu, Victor, 4,507,649, Cl. 340-347.0AD.

Zeigler, James E. L.: *See*—
Goodwin, Eber L.; and Zeigler, James E. L., 4,506,879, Cl. 271-238.000.

Zeitler, Louie; and Liber, David C., to Die-Matic Corporation. Mine roof bearing plate. 4,507,020, Cl. 405-259.000.

Zellweger, Conrad; and Spreter, Victor, to Pozel S.A. Heating device. 4,506,654, Cl. 126-262.000.

Zemanek, Joseph, Jr., to Mobil Oil Corporation. Method of locating potential low water cut hydrocarbon reservoirs in high water saturation sands. 4,506,548, Cl. 73-152.000.

Zenith Electronics Corporation: *See*—
Srivastava, Gopal K., 4,507,682, Cl. 358-178.000.

Zenpo, Hideharu: *See*—
Suzuki, Takeo; Yurita, Yoshihiro; and Zenpo, Hideharu, 4,507,042, Cl. 414-680.000.

Ziegler, Alfred; and Musil, Gerhard, to Siemens Aktiengesellschaft. Device for initiating the remote feed of electrical users. 4,507,568, Cl. 307-112.000.

Ziemelis, Maris J.: *See*—
Tangney, Thomas J.; and Ziemelis, Maris J., 4,507,455, Cl. 528-26.000.

Zillessen, Christoph: *See*—
Hofmann, Heinz; Striepeke, Wilhelm; Werner, Manfred; Kleinherne, Herbert; and Zillessen, Christoph, 4,507,021, Cl. 405-288.000.

Zinser Textilmaschinen GmbH: *See*—
Krieger, Klaus E., 4,506,414, Cl. 19-240.000.

Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, to Voest-Alpine Aktiengesellschaft. Device for cooling the bits of a cutting machine. 4,506,932, Cl. 299-1.000.

Zojirushi Baby Co., Ltd.: *See*—
Miyagi, Takeshi, 4,506,907, Cl. 280-642.000.

Zwolle, Simon, to Shell Oil Company. Method for increasing the bonding strength between grains in a subsurface formation zone. 4,506,732, Cl. 166-292.000.

Zymark Corporation: *See*—
Hutchins, Burleigh M.; Dunlap, Raymond R.; and Abrahams, Louis, 4,507,044, Cl. 414-744.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF MARCH, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cook, Inc.: *See*—
Osborne, Thomas A., Re. 31,855, Cl. 604-161.000.

Egami, Tetsufumi, to Shimano Industrial Company Limited. Front derailleur for a bicycle. Re. 31,854, Cl. 474-82.000.

FMC Corporation: *See*—
Vande Castle, Jerome J., Re. 31,853, Cl. 53-53.000.

Osborne, Thomas A., to Cook, Inc. Tear apart cannula. Re. 31,855, Cl. 604-161.000.

Pannenbecker, Heinrich; and Plate, Rudolf. Process for producing film and sheet materials from thermoplastic materials having hot tack by the blown film process and the film and sheet materials thereby obtained. Re. 31,856, Cl. 156-244.140.

Plate, Rudolf: *See*—
Pannenbecker, Heinrich; and Plate, Rudolf, Re. 31,856, Cl. 156-244.140.

Shimano Industrial Company Limited: *See*—
Egami, Tetsufumi, Re. 31,854, Cl. 474-82.000.

Vande Castle, Jerome J., to FMC Corporation. Package flap folding apparatus. Re. 31,853, Cl. 53-53.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allaire, Roger A.; and VanDewoestine, Robert V., to Corning Glass Works. Wood burning stove. B1 4,345,528, 3-26-85, Cl. 110-203.000.

Benson, Clark K.: *See*—
Caridis, Andrew A.; and Benson, Clark K., B1 3,947,241, Cl. 432-121.000.

Bhattacharyya, Asita; Dormoy, Michel J. C.; and Richard, Gerard Y., to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Self-hardening molding compositions. B1 4,088,624, 3-26-85, Cl. 524-425.000.

Blackstone Manufacturing Co., Inc.: *See*—
Weiler, Raywood C., B1 8,256,345, Cl. D12-202.000.

Caridis, Andrew A.; and Benson, Clark K., to Heat and Control, Inc. Food treatment apparatus and process. B1 3,947,241, 3-26-85, Cl. 432-121.000.

Cork, Gordon H., to McGraw-Edison. Rolling conductor support. B1 3,590,854, 3-26-85, Cl. 137-355.160.

Corning Glass Works: *See*—
Allaire, Roger A.; and VanDewoestine, Robert V., B1 4,345,528, Cl. 110-203.000.

Dormoy, Michel J. C.: *See*—
Bhattacharyya, Asita; Dormoy, Michel J. C.; and Richard, Gerard Y., B1 4,088,624, Cl. 524-425.000.

Hayssen Manufacturing Company: *See*—
James, Robert C., B1 4,288,965, Cl. 53-451.000.

Heat and Control, Inc.: *See*—
Caridis, Andrew A.; and Benson, Clark K., B1 3,947,241, Cl. 432-121.000.

James, Robert C., to Hayssen Manufacturing Company. Form-fill-seal packaging method and apparatus. B1 4,288,965, 3-26-85, Cl. 53-451.000.

McGraw-Edison: *See*—
Cork, Gordon H., B1 3,590,854, Cl. 137-355.160.

NRM Corporation: *See*—
Singh, Anand P.; and Schichman, Daniel, B1 4,332,536, Cl. 425-33.000.

Richard, Gerard Y.: *See*—
Bhattacharyya, Asita; Dormoy, Michel J. C.; and Richard, Gerard Y., B1 4,088,624, Cl. 524-425.000.

Schichman, Daniel: *See*—
Singh, Anand P.; and Schichman, Daniel, B1 4,332,536, Cl. 425-33.000.

Schierz, Winfried, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Housing and lead structure for a series connected semiconductor rectifier arrangement. B1 4,047,197, 3-26-85, Cl. 357-81.000.

Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See*—
Schierz, Winfried, B1 4,047,197, Cl. 357-81.000.

Singh, Anand P.; and Schichman, Daniel, to NRM Corporation. Hydraulic tire press. B1 4,332,536, 3-26-85, Cl. 425-33.000.

Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See*—
Bhattacharyya, Asita; Dormoy, Michel J. C.; and Richard, Gerard Y., B1 4,088,624, Cl. 524-425.000.

VanDewoestine, Robert V.: *See*—
Allaire, Roger A.; and VanDewoestine, Robert V., B1 4,345,528, Cl. 110-203.000.

Weiler, Raywood C., to Blackstone Manufacturing Co., Inc. Tire carrier for a van type vehicle. B1 8,256,345, 3-26-85, Cl. D12-202.000.

LIST OF DESIGN PATENTEES

Aihara, Takayuki; Kawakami, Kazuo; and Nagai, Yawara, to Olympus Optical Co. Ltd. Cuvette for a sample of liquid serum or the like. 278,182, 3-26-85, Cl. D24-29.000.

Akiyoshi, Reiko. Case for baby teeth. 278,097, 3-26-85, Cl. D3-74.000.

Alcala, Amancio; Norton, James A.; and Smith, Martin, to Media Systems Technology Inc. Floppy disk copier machine. 278,148, 3-26-85, Cl. D14-107.000.

American Cyanamid Company: *See*—
Harris, Ned, 278,119, Cl. D9-300.000.
Harris, Ned, 278,122, Cl. D9-385.000.
Harris, Ned, 278,123, Cl. D9-385.000.

Archibald, G. Kent; and Blume, Gerald W., to Minnesota Mining and Manufacturing Company. Intravenous volumetric infusion pump. 278,181, 3-26-85, Cl. D24-8.000.

Baker, Mark H., to Joseph, David H. Electronic musical instrument keyboard. 278,154, 3-26-85, Cl. D17-9.000.

Bally Manufacturing Corporation: *See*—
Nutting, David, 278,160, Cl. D21-13.000.

Bellanca, Gary J., to Wright Line Inc. Side indexing card for a binder or the like. 278,159, 3-26-85, Cl. D19-100.000.

Benham, Albert A., to Champion International Corporation. Display carton. 278,125, 3-26-85, Cl. D9-418.000.

Benham, Albert A., to Champion International Corporation. Display carton. 278,126, 3-26-85, Cl. D9-418.000.

Benicaso, Girard A., to Milton Bradley International, Inc. Riding toy. 278,161, 3-26-85, Cl. D21-74.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 278,103, Cl. D6-381.000.

Blume, Gerald W.: *See—*
Archibald, G. Kent; and Blume, Gerald W., 278,181, Cl. D24-8.000.
Boland, Edward J., II. Wine rack. 278,110, 3-26-85, Cl. D6-465.000.
Brooks, Steven: *See—*
Dunbar, Jack G.; and Brooks, Steven, 278,104, Cl. D6-379.000.
Burenga, Thomas I., to Worksaver, Inc. Mixer. 278,150, 3-26-85, Cl. D15-19.000.
Canyon Corporation: *See—*
Tada, Tetsuya, 278,127, Cl. D9-434.000.
Cargile, John W., Jr., to Container Corporation of America. Outdoor birdfeeder. 278,169, 3-26-85, Cl. D30-15.000.
Carignan, Robert L.; Effler, Timothy; and Holden, John E. Toy take-apart engine. 278,163, 3-26-85, Cl. D21-125.000.
Carmagnola, Ernest D.; and Natale, Peter. Scooter. 278,162, 3-26-85, Cl. D21-80.000.
Carousel Group, Inc., The: *See—*
Prophet, Wilson B., Jr.; Wolfe, William G.; and Simmons, Thomas J., 278,113, Cl. D7-27.000.
Prophet, Wilson B., Jr.; Wolfe, William G.; and Simmons, Thomas J., 278,114, Cl. D7-38.000.
Champion International Corporation: *See—*
Benham, Albert A., 278,125, Cl. D9-418.000.
Benham, Albert A., 278,126, Cl. D9-418.000.
Chan, Peter. Combined residential control console, control slave unit and wall switch for the remote control of lights and appliances. 278,142, 3-26-85, Cl. D13-32.000.
Chatten, Victor H. Novelty clock. 278,129, 3-26-85, Cl. D10-6.000.
Christian, Francis R., to Merit Company, The. Casket corner plate. 278,174, 3-26-85, Cl. D99-13.000.
Coats & Clark, Inc.: *See—*
Dunn, James R., 278,158, Cl. D19-91.000.
Cochran, Joseph C. Vest or similar article. 278,090, 3-26-85, Cl. D2-190.000.
Container Corporation of America: *See—*
Cargile, John W., Jr., 278,169, Cl. D30-15.000.
Coussie, Jean-Vincent, to Union Cooperative de Viticulteurs Charentais. Bottle. 278,124, 3-26-85, Cl. D9-389.000.
Craver, Richard D., to Orrville Products, Inc. Fireplace insert. 278,179, 3-26-85, Cl. D23-94.000.
Dart Industries Inc.: *See—*
Leininger, Janice L., 278,115, Cl. D7-392.000.
Day, Barbara W. Reversible vest or similar article. 278,089, 3-26-85, Cl. D2-190.000.
Dunbar Furniture, Inc.: *See—*
Dunbar, Jack G.; and Brooks, Steven, 278,104, Cl. D6-379.000.
Dunbar, Jack G.; and Brooks, Steven, to Dunbar Furniture, Inc. Chair or similar article. 278,104, 3-26-85, Cl. D6-379.000.
Dunn, James R., to Coats & Clark, Inc. Note memo holder. 278,158, 3-26-85, Cl. D19-91.000.
Effler, Timothy: *See—*
Carignan, Robert L.; Effler, Timothy; and Holden, John E., 278,163, Cl. D21-125.000.
Ellis, Mark L. Auto roof hoist. 278,172, 3-26-85, Cl. D34-33.000.
Evans, David M., to Wright-Bernet Incorporated. Blacktop applicator brush and squeege combination. 278,099, 3-26-85, Cl. D4-116.000.
Evans, Robert B. Swimfin with flexible fin member having movable tips. 278,165, 3-26-85, Cl. D21-239.000.
Felix, Gary. Anemometric wind vane. 278,131, 3-26-85, Cl. D10-59.000.
Fibrecast (UK) Limited: *See—*
Thornalley, Michael J., 278,177, Cl. D21-247.000.
Fibrester, S.A.: *See—*
Vila Enfedaque, Ramon, 278,138, Cl. D12-304.000.
Firestone Tire & Rubber Company, The: *See—*
Larsen, Gary R.; and Gray, Harold C., 278,137, Cl. D12-147.000.
Frielingsdorf, Frank: *See—*
Kuykendall, John; Frielingsdorf, Frank; and Hofer, Alan, 278,147, Cl. D14-28.000.
Fujii, Kiyoshi: *See—*
Hara, Kunio; Sutoh, Shigeru; Okuyama, Tooru; and Fujii, Kiyoshi, 278,152, Cl. D16-31.000.
Fusco, Philip P. Cabinet. 278,107, 3-26-85, Cl. D6-471.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed sandal. 278,092, 3-26-85, Cl. D2-296.000.
Gavin, Brian J.; Gavin, Christopher C.; and Gavin, Michael T. Coffee filter holder. 278,116, 3-26-85, Cl. D7-400.000.
Gavin, Christopher C.: *See—*
Gavin, Brian J.; Gavin, Christopher C.; and Gavin, Michael T., 278,116, Cl. D7-400.000.
Gavin, Michael T.: *See—*
Gavin, Brian J.; Gavin, Christopher C.; and Gavin, Michael T., 278,116, Cl. D7-400.000.
Gerico Fiberglass Products, Inc.: *See—*
Myers, Dean, 278,183, Cl. D24-38.000.
Go, Seitaro, to Ugen Kaisha Go Chuzo Tekko Sho. Guide unit for associating tubular casings with nuclear fuel rod assemblies. 278,151, 3-26-85, Cl. D15-199.000.
Goodyear Tire & Rubber Company, The: *See—*
Menster, Armand M.; and Hitzky, Leo J., 278,135, Cl. D12-143.000.
Grant, Lynd L.; and Steinfurth, James, to National Packaging Corporation. Bottle. 278,120, 3-26-85, Cl. D9-302.000.
Gray, Harold C.: *See—*
Larsen, Gary R.; and Gray, Harold C., 278,137, Cl. D12-147.000.
Green, George G. Shower hanger support for standard and hotel hangers. 278,106, 3-26-85, Cl. D6-525.000.
Halicho, James J.: *See—*
Houlihan, John T.; and Halicho, James J., 278,130, Cl. D10-38.000.
Hara, Kunio; Sutoh, Shigeru; Okuyama, Tooru; and Fujii, Kiyoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying machine. 278,152, 3-26-85, Cl. D16-31.000.
Hardtke, Russell V. Object for use in meditation and tranquilization. 278,175, 3-26-85, Cl. D99-25.000.
Harris, Ned, to American Cyanamid Company. Combined bottle and cap. 278,119, 3-26-85, Cl. D9-300.000.
Harris, Ned, to American Cyanamid Company. Bottle. 278,122, 3-26-85, Cl. D9-385.000.
Harris, Ned, to American Cyanamid Company. Bottle. 278,123, 3-26-85, Cl. D9-385.000.
Hayashi, Shigeaki: *See—*
Sawada, Masaji; Sakaguchi, Hiroshi; Hayashi, Shigeaki; and Yamada, Kazuo, 278,156, Cl. D18-7.000.
Hill, Royce W., to Micro Plastics Inc. Printed circuit board standoff. 278,143, 3-26-85, Cl. D13-99.000.
Hittell, Frank T.: *See—*
Lyman, Ron L.; and Hittell, Frank T., 278,108, Cl. D6-426.000.
Hitzky, Leo J.: *See—*
Menster, Armand M.; and Hitzky, Leo J., 278,135, Cl. D12-143.000.
Hofer, Alan: *See—*
Kuykendall, John; Frielingsdorf, Frank; and Hofer, Alan, 278,147, Cl. D14-28.000.
Holden, John E.: *See—*
Carignan, Robert L.; Effler, Timothy; and Holden, John E., 278,163, Cl. D21-125.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Oba, Yasuhiro, 278,136, Cl. D12-146.000.
Hoshino, Kunio: *See—*
Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Takenaka, Kazumasa; and Kido, Katsutoshi, 278,144, Cl. D14-5.000.
Hosoo, Tomohiro: *See—*
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, 278,157, Cl. D19-51.000.
Houlihan, John T.; and Halicho, James J., to Timex Corporation. Watch. 278,130, 3-26-85, Cl. D10-38.000.
Hoyt, Earl E., to Johnson & Johnson Products Inc. Bottle. 278,118, 3-26-85, Cl. D9-403.000.
Hughes, Sarah C. Brush for removing corn silk. 278,100, 3-26-85, Cl. D4-135.000.
Hyde Park Metalfab Inc.: *See—*
Root, David L., 278,176, Cl. D99-28.000.
International Business Machines: *See—*
Naito, Marina, 278,149, Cl. D14-113.000.
Jenkins, Wendell L., to W. L. Jenkins Company, The. Combined warning light and bell for industrial and institutional applications. 278,134, 3-26-85, Cl. D10-114.000.
Johnson & Johnson Products Inc.: *See—*
Hoyt, Earl E., 278,118, Cl. D9-403.000.
Johnson, Logan W., to Rosemount Inc. Flowmeter transmitter circuitry housing. 278,133, 3-26-85, Cl. D10-100.000.
Joseph, David H.: *See—*
Baker, Mark H., 278,154, Cl. D17-9.000.
Kangaroos U.S.A., Inc.: *See—*
Gamm, Robert J., 278,092, Cl. D2-296.000.
Kawakami, Kazuo: *See—*
Aihara, Takayuki; Kawakami, Kazuo; and Nagai, Yawara, 278,182, Cl. D24-29.000.
Kido, Katsutoshi: *See—*
Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Takenaka, Kazumasa; and Kido, Katsutoshi, 278,144, Cl. D14-5.000.
Kikukawa, Katsuyoshi: *See—*
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, 278,157, Cl. D19-51.000.
Kilham, Peter. Bird feeder. 278,166, 3-26-85, Cl. D30-14.000.
Kilham, Peter. Bird feeder tray. 278,167, 3-26-85, Cl. D30-14.000.
Koper, Barry R. Facial appliance for makeup. 278,164, 3-26-85, Cl. D21-190.000.
Korn, Lorelei. Boot. 278,091, 3-26-85, Cl. D2-288.000.
Kuykendall, John; Frielingsdorf, Frank; and Hofer, Alan, to Pickering & Company, Inc. Phonograph cartridge. 278,147, 3-26-85, Cl. D14-28.000.
Larsen, Gary R.; and Gray, Harold C., to Firestone Tire & Rubber Company, The. Tire. 278,137, 3-26-85, Cl. D12-147.000.
Latham, Peter A.; and Velinsky, Ira, to Opus, Inc. Bird feeder. 278,168, 3-26-85, Cl. D30-15.000.
Leeds, Douglas B., to Thomson-Leeds Company, Inc. Literature holder. 278,109, 3-26-85, Cl. D6-419.000.
Leininger, Janice L., to Dart Industries Inc. Container cover with pour spout or the like. 278,115, 3-26-85, Cl. D7-392.000.
Long, Stapleton, to Berkline Corporation, The. Sofa. 278,103, 3-26-85, Cl. D6-381.000.
Loyd, Joseph. Tiltable toilet seat for disabled persons. 278,178, 3-26-85, Cl. D23-71.000.
Lyman, Ron L.; and Hittell, Frank T. Modular computer desk. 278,108, 3-26-85, Cl. D6-426.000.
Maki, Mitsuo; Hosoo, Tomohiro; and Kikukawa, Katsuyoshi, to Platinum Pen of America. Ball point pen. 278,157, 3-26-85, Cl. D19-51.000.
Matsumoto, Yoshiharu, to Sony Corporation. Magnetic tape cassette. 278,145, 3-26-85, Cl. D14-11.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Takenaka, Kazumasa; and Kido, Katsutoshi, 278,144, Cl. D14-5.000.
Mazeika, Albert. Frame corner retainer. 278,111, 3-26-85, Cl. D6-491.000.
McCabe, Gerald L. Convertible table. 278,101, 3-26-85, Cl. D6-478.000.

Media Systems Technology Inc.: *See*—
Alcala, Amancio; Norton, James A.; and Smith, Martin, 278,148, Cl. D14-107.000.

Megill, Joseph F.; and Pagliaroni, James V. Spray washer for paint rollers. 278,170, 3-26-85, Cl. D32-35.000.

Menster, Armand M.; and Hitzky, Leo J., to Goodyear Tire & Rubber Company, The. Tire. 278,135, 3-26-85, Cl. D12-143.000.

Merit Company, The: *See*—
Christian, Francis R., 278,174, Cl. D99-13.000.

Micro Plastics Inc.: *See*—
Hill, Royce W., 278,143, Cl. D13-99.000.

Milton Bradley International, Inc.: *See*—
Benicaso, Girard A., 278,161, Cl. D21-74.000.

Minnesota Mining and Manufacturing Company: *See*—
Archibald, G. Kent; and Blume, Gerald W., 278,181, Cl. D24-8.000.

Mishiro, Benito; Ohta, Kikuo; Hoshino, Kunio; Takenaka, Kazumasa; and Kido, Katsutoshi, to Matsushita Electric Industrial Co., Ltd. Combined tape recorder and radio receiver. 278,144, 3-26-85, Cl. D14-5.000.

Montes, Thomas G.: *See*—
Walker, John R.; and Montes, Thomas G., 278,096, Cl. D3-38.000.

Morris, Clive J., to Texalon International Limited. Cart for supporting a line marker. 278,173, 3-26-85, Cl. D34-17.000.

Morrison, Jesse L., to Nordson Corporation. Control cabinet. 278,139, 3-26-85, Cl. D13-12.000.

Myers, Dean, to Gerico Fiberglass Products, Inc. Hydrotherapy spa. 278,183, 3-26-85, Cl. D24-38.000.

Nagai, Yawara: *See*—
Aihara, Takayuki; Kawakami, Kazuo; and Nagai, Yawara, 278,182, Cl. D24-29.000.

Naito, Marina, to International Business Machines. Computer display or the like. 278,149, 3-26-85, Cl. D14-113.000.

Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Oil-fired space heater. 278,180, 3-26-85, Cl. D23-123.000.

Natale, Peter: *See*—
Carmagnola, Ernest D.; and Natale, Peter, 278,162, Cl. D21-80.000.

National Packaging Corporation: *See*—
Grant, Lynd L.; and Steinfurth, James, 278,120, Cl. D9-302.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ohta, Kunio, 278,153, Cl. D17-9.000.

Nippon Rubber Co., Ltd.: *See*—
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CLASSIFICATION OF PATENTS

ISSUED MARCH 26, 1985

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121 PY 4,507,539
124.34 4,507,541
130.51 4,507,542
137 PS 4,507,543
209 4,507,544
230 4,507,545
497 4,507,546
543 4,507,547

CLASS 220

1.5 4,506,798
69 4,506,799

CLASS 221

6 4,506,800
26 4,506,801
75 4,506,802

CLASS 222

1 4,506,803
64 4,506,804
153 4,506,805
175 4,506,806
181 4,506,807
182 4,506,808
213 4,506,809
391 4,506,810
411 4,506,811
536 4,506,812
590 4,506,813
591 4,506,814
630 4,506,815

CLASS 225

48 4,506,816
96.5 4,506,817

CLASS 227

67 4,506,818
120 4,506,819

CLASS 228

5.7 4,506,821
39 4,506,820
200 4,506,822

CLASS 229

92.8 4,506,823

CLASS 234

28 4,506,824

CLASS 235

94 R 4,507,548
96 4,507,549
449 4,507,550

CLASS 236

9 A 4,506,825
46 R 4,506,826
4,506,827
49 4,506,828
4,506,829
4,506,830

CLASS 239

10 4,506,831
265.35 4,506,832
533.4 4,506,833

CLASS 241

1 4,506,834
20 4,506,835
37.5 4,506,836
97 4,506,837
98 4,506,838
101.7 4,506,839
4,506,840

CLASS 242

55 4,506,841
58.3 4,506,842
74 4,506,843
107.4 A 4,506,844
107.7 4,506,845
199 4,506,846

CLASS 244

1 R 4,506,847
12.4 4,506,848
17.21 4,506,849
54 4,506,850
129.1 4,506,851
158 R 4,506,852

CLASS 248

79 4,506,853
96 4,506,854
206.2 4,506,855
222.1 4,506,856
655 4,506,857

CLASS 250

216 4,507,551
259 4,507,552
270 4,507,553
4,507,554
281 4,507,555
341 4,507,556
4,507,557
345 4,507,558
396 R 4,507,559
483.1 4,507,560
484.1 4,507,561
4,507,562
486.1 4,507,563
563 4,507,564

CLASS 251

1 A 4,506,858
63 4,506,859
124 4,506,860
139 4,506,861
149.5 4,506,862
149.9 4,506,863
174 4,506,864
366 4,506,865

CLASS 252

8.5 A 4,507,210
8.55 D 4,507,211
4,507,212
8.55 R 4,507,213
18 4,507,214
32.7 E 4,507,215
49.6 4,507,216
62.54 4,507,217
70 4,507,218
118 4,507,219
186.1 4,507,220
299.1 4,507,221
299.63 4,507,222
353 4,507,223
516 4,507,224
522 R 4,507,225
600 4,507,226
626 4,507,227

CLASS 254

2 B 4,506,866
108 4,506,867

CLASS 260

97.6 4,507,228
112 B 4,507,229
112.5 R 4,507,230
4,507,231
4,507,232
4,507,235
115 4,507,233
121 4,507,234
157 4,507,237
239 BD 4,507,311
239.3 P 4,507,295
239.57 4,507,238
245.2 R 4,507,239
384 4,507,240
396 R 4,507,241
397.3 4,507,242
410.5 4,507,243
428.5 4,507,244
429.2 4,507,245
429.5 4,507,246
446 4,507,247
500.5 H 4,507,248
502.4 R 4,507,249
502.5 F 4,507,250
944 4,507,251
986 4,507,252

CLASS 261

22 4,507,253

CLASS 264

1.9 4,507,254
45.1 4,507,255
54 4,507,256
78 4,507,257
255 4,507,258

CLASS 267

3 4,506,868
64.15 4,506,869

CLASS 269

24 4,506,871
322 4,506,872

CLASS 270

46 4,506,873

CLASS 271

35 4,506,874
99 4,506,875
104 4,506,876
127 4,506,877
227 4,506,878
238 4,506,879
263 4,506,880
277 4,506,881
303 4,506,882

CLASS 272

99 4,506,883
127 4,506,884
128 4,506,895

CLASS 273

1.5 A 4,506,886
73 F 4,506,887
80.1 4,506,888
84 R 4,506,889
138 A 4,506,890
153 R 4,506,892
153 S 4,506,891
258 4,506,893
425 4,506,894

CLASS 277

1 4,506,895

CLASS 279

118 4,506,896

CLASS 280

40 4,506,897
43.23 4,506,898
91 4,506,899
242 WC 4,506,900
4,506,901
266 4,506,902
289 WC 4,506,903
415 R 4,506,904
633 4,506,905
642 4,506,906
4,506,907
677 4,506,908
707 4,506,909
711 4,506,910
801 4,506,911
803 4,506,912

CLASS 283

56 4,506,913
70 4,506,914
75 4,506,915
91 4,506,916

CLASS 285

4 4,506,917
156 4,506,918
231 4,506,919

CLASS 289

8 4,506,920

CLASS 290

38 R 4,507,565
4,507,566

CLASS 292

318 4,506,921
336.3 4,506,922

CLASS 294

87.1 4,506,923
89 4,506,924

CLASS 296

1 S 4,506,870

CLASS 297

69 4,506,925
83 4,506,926
118 4,506,927
174 4,506,928
230 4,506,929
423 4,506,930

CLASS 299

1 4,506,931
4,506,932

CLASS 305

35 R 4,506,933
57 4,506,934

CLASS 307

106 4,507,567
112 4,507,568
130 4,507,569
273 4,507,570
278 4,507,571
296 R 4,507,572
297 4,507,573
448 4,507,574
456 4,507,575
475 4,507,576
494 4,507,577
520 4,507,578

CLASS 308

5 R 4,506,935

CLASS 310

23 4,507,579
214 4,507,580
313 B 4,507,581
327 4,507,582
338 4,507,583

CLASS 313

471 4,507,585
624 4,507,584

CLASS 315

3 4,507,586
39 4,507,587
4,507,588
111.01 4,507,589

CLASS 318

254 4,507,590
4,507,591
268 4,507,592
563 4,507,593
615 4,507,594
630 4,507,595
640 4,507,596
653 4,507,597
687 4,507,598
696 4,507,599

CLASS 323

281 4,507,600
347 4,507,601

CLASS 324

58 R 4,507,602
61 P 4,507,603
71.1 4,507,604
73 PC 4,507,605
158 R 4,507,606
164 4,507,607
220 4,507,608
230 4,507,609
238 4,507,610
323 4,507,611
329 4,507,612
340 4,507,613

CLASS 328

142 4,507,615
233 4,507,614
234 4,507,616

CLASS 329

50 4,507,617

CLASS 330

126 4,507,618
297 4,507,619
307 4,507,620

CLASS 331

78 4,507,621
115 4,507,622
154 4,507,623

CLASS 332

11 D 4,507,624
31 R 4,507,625
4,507,626

CLASS 333

105 4,507,627
138 4,507,628
164 4,507,629
182 4,507,630
222 4,507,631
258 4,507,632

CLASS 335

202 4,507,633
272 4,507,634
291 4,507,635

CLASS 336

12 4,507,636
65 4,507,637
79 4,507,638
115 4,507,639
223 4,507,640

CLASS 337

6 4,507,641
89 4,507,642

CLASS 338

34 4,507,643

CLASS 339

14 R 4,506,937
17 C 4,506,939
17 CF 4,506,938
17 LC 4,506,940
75 M 4,506,941
89 M 4,506,942
90 R 4,506,943
143 R 4,506,944

CLASS 340

64 4,507,644
310 A 4,507,645
310 R 4,507,646
347 AD 4,507,649
347 DA 4,507,650
347 DD 4,507,648
347 P 4,507,647
365 L 4,507,651
501 4,507,652
539 4,507,653
545 4,507,654
641 4,507,655
739 4,507,656
959 4,507,657

CLASS 343

12 R 4,507,658
17.2 PC 4,507,659
18 A 4,507,660
351 4,507,661
376 4,507,662
440 4,503,663
700 MS 4,507,664
786 4,507,665

CLASS 346

76 PH 4,507,666
4,507,667
4,507,668
207 4,507,669
208 4,507,670
216 4,507,671

CLASS 350

3.6 4,506,945
96.21 4,506,946
4,506,947
96.23 4,506,948
162.19 4,506,949
238 4,506,950
253 4,506,951
255 4,506,952
276 R 4,506,953
336 4,506,955
339 F 4,506,956

349 4,506,957
427 4,506,958
430 4,506,959
529 4,506,960
634 4,506,954

CLASS 351

137 4,506,961
160 R 4,506,962
203 4,506,963

CLASS 354

122 4,506,964
173.1 4,506,965
195.1 4,506,966
223 4,506,967
286 4,506,968
298 4,506,969
406 4,506,970

CLASS 355

3 DD 4,506,972
4,506,973
3 TR 4,506,971
14 R 4,506,974
14 SH 4,506,978
15 4,506,975
45 4,506,976
53 4,506,977

CLASS 356

28.5 4,506,979
237 4,506,980
347 4,506,981

CLASS 357

8 4,507,672
23 R 4,507,673
30 4,507,674
70 4,507,675
81 B1 4,047,197

CLASS 358

30 4,507,676
50 4,507,677
51 4,507,678
55 4,507,679
86 4,507,680
111 4,507,681
178 4,507,682
185 4,507,683
213 4,507,684
283 4,507,685
310 4,507,686
335 4,507,687

CLASS 360

13 4,507,688
14.3 4,507,691
33.1 4,507,689
4,507,690
60 4,507,692
72.2 4,507,693
90 4,507,694
105 4,507,695
109 4,507,696

CLASS 361

1 4,507,697
42 4,507,698
50 4,507,699
80 4,507,700
92 4,507,713
127 4,507,701
161 4,507,702
193 4,507,703
264 4,507,704
283 4,507,705
331 4,507,706
380 4,507,707
392 4,507,708
400 4,507,709
428 4,507,710

CLASS 362

61 4,507,711
4,507,712
126 4,507,714
153 4,507,715
295 4,507,716
304 4,507,717
396 4,507,718
404 4,507,719

CLASS 363

13 4,507,720
21 4,507,721
79 4,507,722
87 4,507,723
98 4,507,724

CLASS 364

200 4,507,726
4,507,727
4,507,728
4,507,729
4,507,730
4,507,731
4,507,732
414 4,507,733
419 4,507,734
422 4,507,735
424.1 4,507,736
453 4,507,737
474 4,507,738
478 4,507,739
487 4,507,740
554 4,507,741
567 4,507,742
708 4,507,744
709 4,507,743
4,507,745
717 4,507,746
724 4,507,725
4,507,747
749 4,507,748
757 4,507,749
900 4,507,750
4,507,751
4,507,752
4,507,753

CLASS 365

19 4,507,754
36 4,507,755
104 4,507,756
4,507,757
182 4,507,758
189 4,507,759
221 4,507,760
230 4,507,761

CLASS 366

19 4,506,982
44 4,506,983
65 4,506,984
107 4,506,985
142 4,506,986
160 4,506,987
203 4,506,988
270 4,506,989
299 4,506,990
341 4,506,991

CLASS 367

137 4,507,762

CLASS 368

282 4,506,992
314 4,506,993

CLASS 369

44 4,507,763
45 4,507,764
4,507,765
4,507,766
54 4,507,767
77.1 4,507,768
77.2 4,507,769
4,507,770
4,507,771
109 4,507,772
110 4,507,773
271 4,507,774

CLASS 370

4 4,507,775
4,507,776
16 4,507,777
94 4,507,778
100 4,507,779
4,507,780
104 4,507,781

CLASS 371

32 4,507,782
49 4,507,783
61 4,507,784

CLASS 372

12 4,507,785
33 4,507,786
62 4,507,787
83 4,507,788
92 4,507,789
100 4,507,790

CLASS 374

28 4,506,994
57 4,506,995
176 4,506,996

CLASS 375

27 4,507,791
30 4,507,792
36 4,507,793
55 4,507,794
95 4,507,795
106 4,507,796

CLASS 376

173 4,507,259
249 4,507,260
270 4,507,261

CLASS 378

165 4,507,797
170 4,507,798
177 4,507,799

CLASS 381

88 4,507,800

CLASS 384

96 4,506,997
312 4,506,998
569 4,506,936

CLASS 400

121 4,506,999
144.2 4,507,000
4,507,001
322 4,507,002
636 4,507,003

CLASS 401

275 4,507,004

CLASS 403

16 4,507,005
24 4,507,006
157 4,507,007
275 4,507,008
306 4,507,009
322 4,507,010
404 4,507,011

CLASS 404

72 4,507,012
75 4,507,013
102 4,507,014
103 4,507,015

CLASS 405

2 4,507,016
66 4,507,017
79 4,507,018
154 4,507,019
259 4,507,020
288 4,507,021

CLASS 406

50 4,507,022

CLASS 407

103 4,507,023
114 4,507,024

CLASS 408

6 4,507,025
72 B 4,507,026
197 4,507,027
230 4,507,028

CLASS 409

114 4,507,029
185 4,507,030
234 4,507,031

CLASS 410

83 4,507,032
104 4,507,033

CLASS 411

21 4,507,034
377 4,507,035

CLASS 412

9 4,507,036
11 4,507,037

CLASS 414

27 4,507,038
152 4,507,039
403 4,507,040
641 4,507,041
680 4,507,042
719 4,507,043
735 4,507,046
744 R 4,507,044
753 4,507,045

CLASS 415

9 4,507,047
90 4,507,048

CLASS 416

51 4,507,049
90 A 4,507,050
97 R 4,507,051
193 A 4,507,052

CLASS 417

12 4,507,053
4,507,054
4,507,055
54 4,507,056
216 4,507,057
270 4,507,058
4,507,059
336 4,507,060
360 4,507,061
413 4,507,062
540 4,507,063

CLASS 418

15 4,507,064
4,507,065
61 A 4,507,066
105 4,507,067
150 4,507,068

CLASS 419

2 4,507,262
48 4,507,263

CLASS 420

443 4,507,264

CLASS 422

186 4,507,265
186.15 4,507,266

CLASS 423

4 4,507,267
24 4,507,268
235 4,507,269
365 4,507,270
387 4,507,271
447.4 4,507,272
558 4,507,273
573 R 4,507,274
574 R 4,507,275

CLASS 424

37 4,507,276
59 4,507,277
62 4,507,278
63 4,507,279
70 4,507,280
85 4,507,281
94 4,507,283
117 4,507,282
130 4,507,285

CLASS 425

33 B1 4,332,536
59 4,507,069
126 S 4,507,070
133.1 4,507,071
185 4,507,072
466 4,507,073

CLASS 426

16 4,507,325
101 4,507,326
276 4,507,327
580 4,507,328
600 4,507,329

CLASS 427

38 4,507,331
48 4,507,457
67 4,507,332
82 4,507,333
93 4,507,334
215 4,507,335
244 4,507,336
261 4,507,330
269 4,507,337

CLASS 428

35 4,507,338
4,507,339
36 4,507,340
78 4,507,341
90 4,507,342
93 4,507,343
99 4,507,344
137 4,507,345
158 4,507,346
166 4,507,347
172 4,507,348
195 4,507,349
196 4,507,350
198 4,507,351
201 4,507,352
222 4,507,353
245 4,507,354
246 4,507,355
252 4,507,356
278 4,507,357
298 4,507,358
328 4,507,359
336 4,507,360
373 4,507,361
375 4,507,324
383 4,507,362
418 4,507,363
457 4,507,364
489 4,507,365
682 4,507,366

CLASS 429

27 4,507,367
62 4,507,368
104 4,507,369
142 4,507,370
191 4,507,371
228 4,507,372

CLASS 430

31 4,507,373
56 4,507,374
109 4,507,376
115 4,507,377
128 4,507,375
137 4,507,378
139 4,507,379
203 4,507,380
246 4,507,381
275 4,507,382
4,507,383
311 4,507,384
523 4,507,385
549 4,507,386

CLASS 431

12 4,507,074
115 4,507,075
117 4,507,076
228 4,507,077

CLASS 432

11 4,507,078
95 4,507,079
105 4,507,080
106 4,507,081
121 B1 3,947,241
224 4,507,082
227 4,507,083

CLASS 433

7 4,507,084
126 4,507,085

CLASS 434

29 4,507,086
98 4,507,087
112 4,507,088
279 4,507,089

CLASS 435

2 4,507,387
12 4,507,388
23 4,507,389

CLASS 436

161 4,507,390
504 4,507,391

CLASS 440

52 4,507,090
73 4,507,091
89 4,507,092

CLASS 441

2 4,507,093
65 4,507,094

CLASS 446

118 4,507,095
176 4,507,096
236 4,507,097
288 4,507,098
389 4,507,099

CLASS 464

111 4,507,100

CLASS 474

82 Re.31,854
4,507,101
101 4,507,102
110 4,507,103
112 4,507,104
144 4,507,105
215 4,507,106

CLASS 493

44 4,507,107
167 4,507,108
356 4,507,109

CLASS 494

10 4,507,110

CLASS 501

4 4,507,392
75 4,507,393
94 4,507,394
115 4,507,395

CLASS 502

8 4,507,396
38 4,507,397
62 4,507,398
63 4,507,399
4,507,400
208 4,507,402
242 4,507,401

CLASS 514

23 4,507,286
43 4,507,287
140 4,507,284
143 4,507,288
170 4,507,289
172 4,507,290
183 4,507,292
212 4,507,296
220 4,507,313
247 4,507,298
249 4,507,294
252 4,507,297
255 4,507,299
4,507,303
262 4,507,305
269 4,507,304
272 4,507,302
274 4,507,301
278 4,507,291
280 4,507,300
291 4,507,306
313 4,507,307
4,507,308
376 4,507,310
379 4,507,309
396 4,507,315
456 4,507,314
471 4,507,312
510 4,507,316
531 4,507,317
4,507,318
546 4,507,319
605 4,507,320
648 4,507,322
649 4,507,323
673 4,507,321

CLASS 516

226 4,507,293

CLASS 518

713 4,507,403
714 4,507,404

CLASS 521

84 4,507,405
85 4,507,406
113 4,507,407

CLASS 523

143 4,507,408
205 4,507,409
211 4,507,410
436 4,507,411
454 4,507,412

CLASS 524

42 4,507,413
100 4,507,414
101 4,507,415
4,507,416
4,507,417
318 4,507,418
327 4,507,419
331 4,507,420
425 4,507,421
4,507,422
B1 4,088,624
427 4,507,423
442 4,507,424
460 4,507,425
505 4,507,426
591 4,507,427
596 4,507,428
800 4,507,429
839 4,507,430
840 4,507,431

CLASS 525

21 4,507,432
54.11 4,507,433
67 4,507,434
86 4,507,435
92 4,507,436
106 4,507,437
119 4,507,438
199 4,507,439
218 4,507,440
438 4,507,441
439 4,507,442
453 4,507,443
455 4,507,444
504 4,507,445
507 4,507,460
523 4,507,446
528 4,507,447

CLASS 526

122 4,507,449
125 4,507,448
128 4,507,450
136 4,507,451
279 4,507,452
283 4,507,453
317 4,507,454

CLASS 528

26 4,507,455
45 4,507,456
49 4,507,458
64 4,507,459
104 4,507,461
125 4,507,462
279 4,507,463
288 4,507,464

CLASSIFICATION OF PATENTS

312	4,507,465
332	4,507,466
348	4,507,467
388	4,507,468
425	4,507,469
499	4,507,470
CLASS 534	
634	4,507,236
695	4,507,124
755	4,507,471
CLASS 536	
51	4,507,472
86	4,507,473
97	4,507,474
120	4,507,475
CLASS 544	
187	4,507,476
250	4,507,477
	4,507,478
348	4,507,479
CLASS 546	
94	4,507,480
121	4,507,481
176	4,507,482
201	4,507,483
210	4,507,484
	4,507,485
345	4,507,486
CLASS 548	
194	4,507,487
362	4,507,488
CLASS 549	
375	4,507,489
CLASS 556	
427	4,507,490
CLASS 560	
64	4,507,492
020	4,507,491
103	4,507,493
193	4,507,494
205	4,507,495
266	4,507,496
CLASS 562	
441	4,507,497
463	4,507,498
CLASS 564	
179	4,507,499
340	4,507,500
CLASS 568	
17	4,507,501
	4,507,502
	4,507,503
	4,507,504
62	4,507,505
401	4,507,506
	4,507,507
487	4,507,508
724	4,507,509
811	4,507,510
852	4,507,511
897	4,507,512
CLASS 570	
190	4,507,513
262	4,507,514
CLASS 585	
12	4,507,515
14	4,507,516
415	4,507,517
610	4,507,518
CLASS 604	
3	4,507,111
65	4,507,112
71	4,507,113
111	4,507,114
135	4,507,115
142	4,507,116
161	Re.31,855
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	288	278,091
	296	278,092
	310	278,093
	325	278,094
D3—	30.1	278,095
	38	278,096
	74	278,097
	99	278,098
D4—	116	278,099
	135	278,100
D6—	379	278,104
		278,105
	381	278,103
	407	278,112
	419	278,109
	426	278,108
	465	278,110
	466	278,102
	471	278,107
	478	278,101
	491	278,111
	525	278,106
D7—	27	278,113
	38	278,114
	392	278,115
	400	278,116
D8—	57	278,117
D9—	300	278,119
	302	278,120
	352	278,121
	385	278,122
		278,123
	389	278,124
	403	278,118
	418	278,125
		278,126
	434	278,127
	455	278,128
D10—	6	278,129
	38	278,130
	59	278,131
	98	278,132
	100	278,133
	114	278,134
D12—	143	278,135
	146	278,136
	147	278,137
	304	278,138
D13—	12	278,139
	23	278,140
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	107	278,148
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	199	278,151
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	74	278,161
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	239	278,165
	247	278,177
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	123	278,180
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CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

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